november 1958

Grinding and finishing

Better Diamond Dressing for Precision Grinding

Continuous Blasting Boosts Production, Cuts Handling

A Guide to Rough Grinding Carbide Tools

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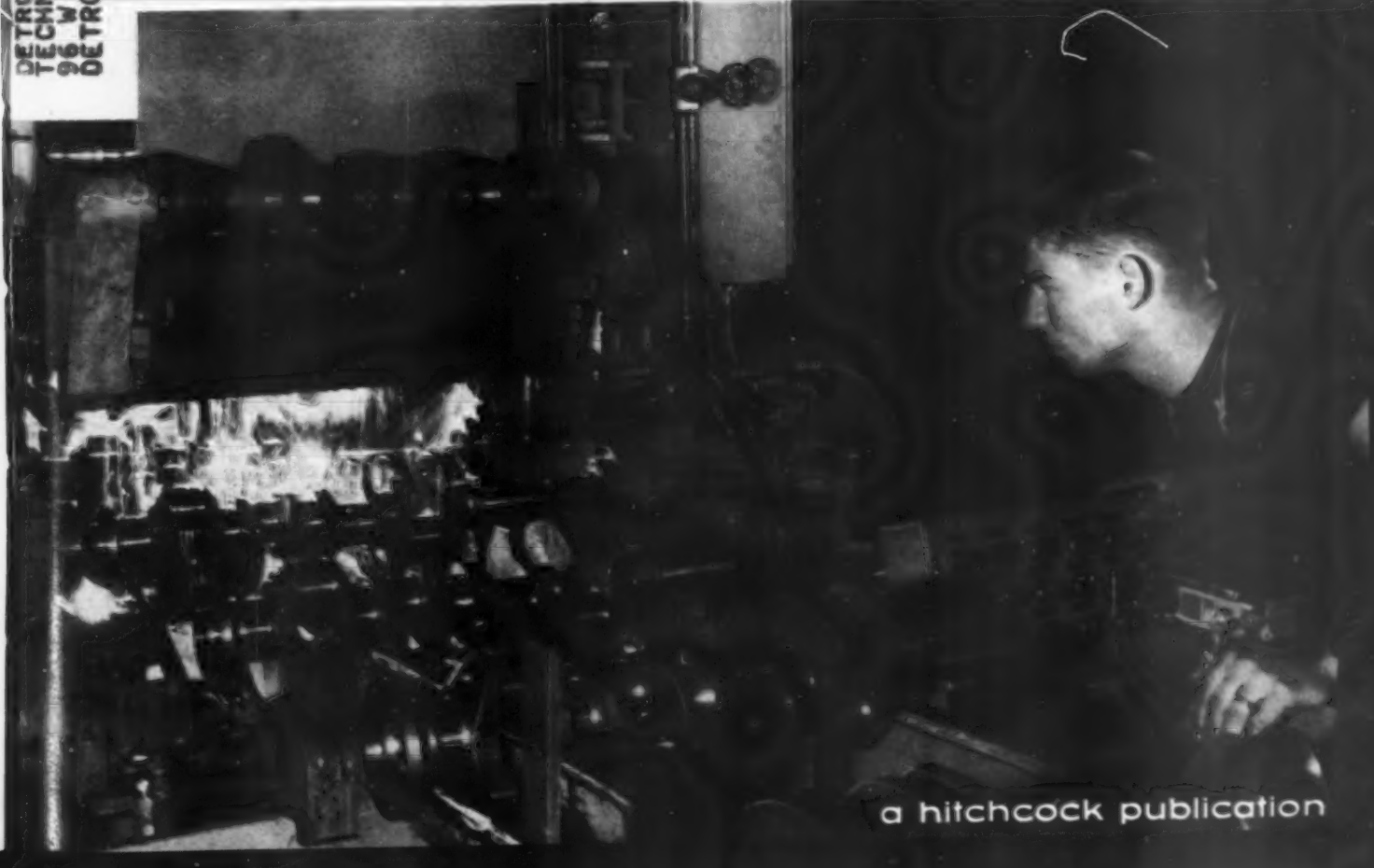
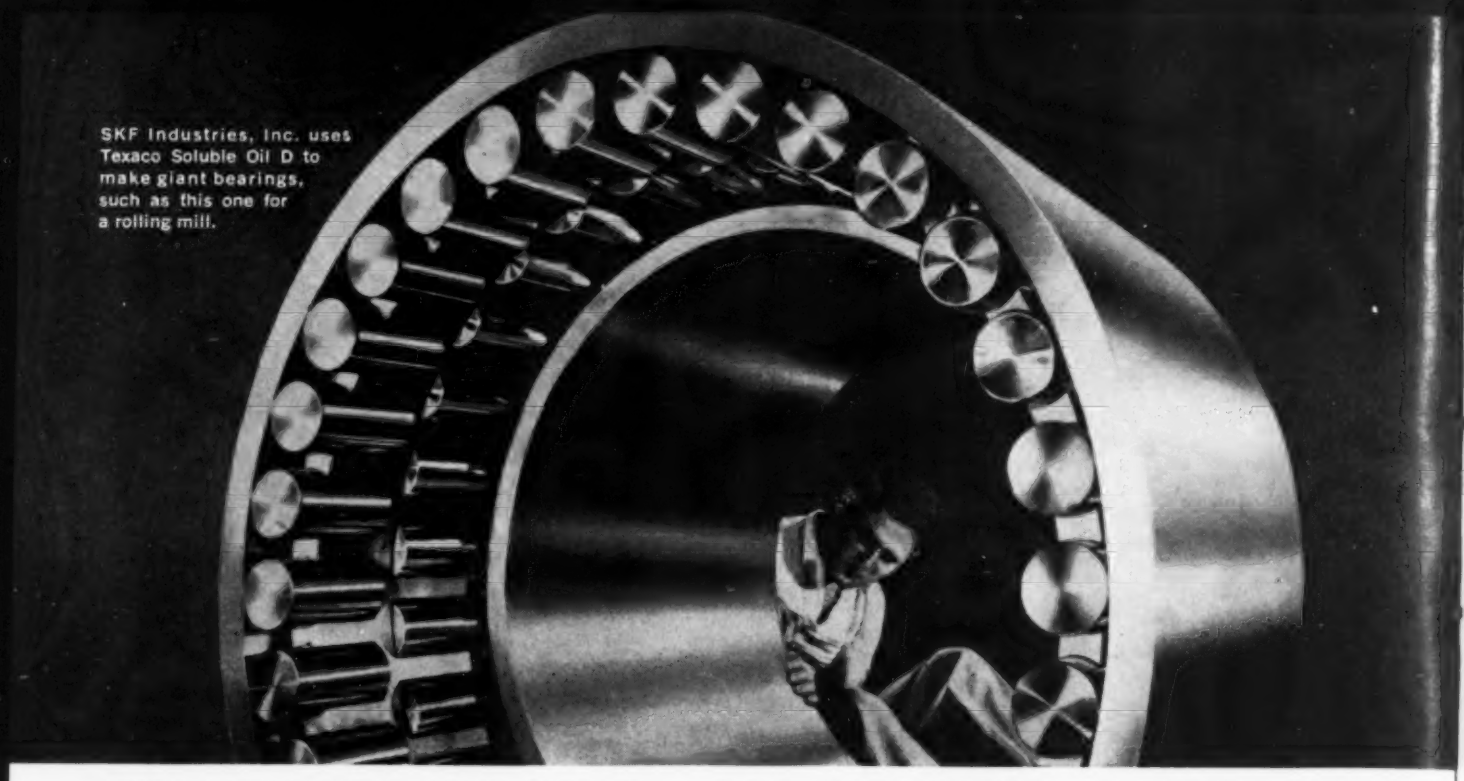
Crankshaft Grinding at Ford's Lima Engine Plant

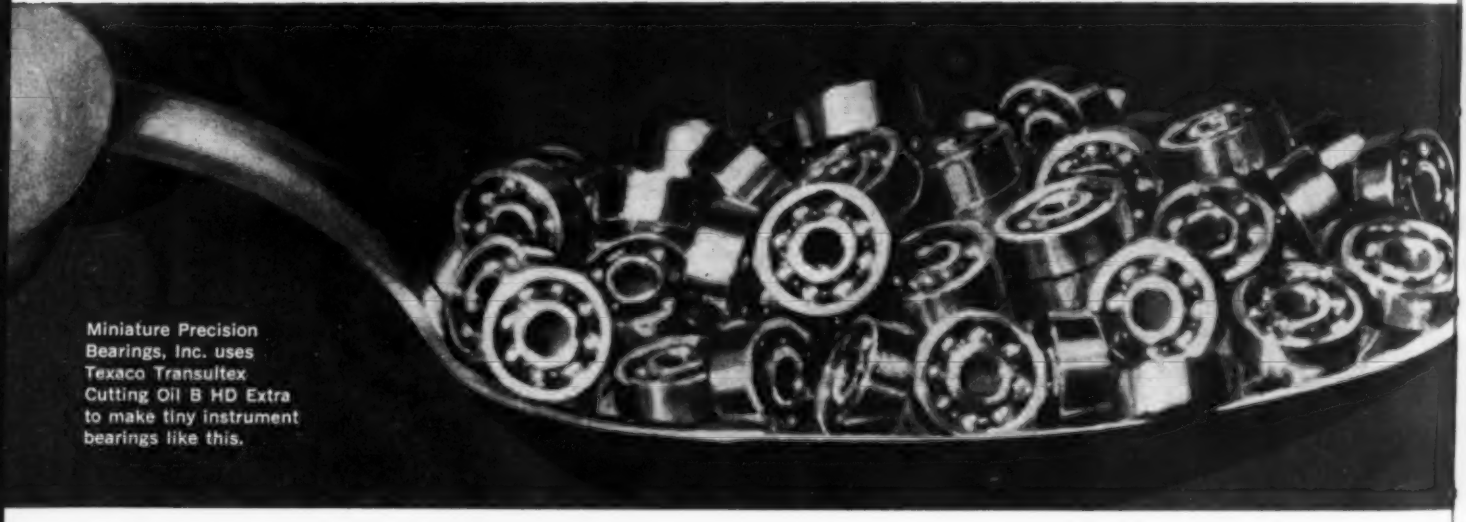


a hitchcock publication



SKF Industries, Inc. uses Texaco Soluble Oil D to make giant bearings, such as this one for a rolling mill.

WHAT SIZE IS YOUR MACHINING PROBLEM?



Miniature Precision Bearings, Inc. uses Texaco Transultex Cutting Oil B HD Extra to make tiny instrument bearings like this.

If you make anti-friction bearings of any size, you need grinding fluids that prevent rust and produce uniformly fine finishes. These fluids must also take into account the bearing material and the operating condition of your machines. They must have specific stability, cooling properties and ability to settle grinding dirt quickly. Otherwise your production drops and the number of rejects rises.

The makers of the small and large bearings shown above get fine bearing finishes and high production by using Texaco. There is a complete line of Texaco Cutting, Grinding and Soluble Oils to help improve machining on every job.

Take this tip. Use Texaco Cutting, Grinding and Soluble Oils—they'll help you produce faster, better and at lower cost, whether your product is the largest or the smallest.

Let a Texaco Lubrication Engineer suggest the best ones for your jobs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

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Wherever abrasive operations are performed

grinding and finishing

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FEATURE ARTICLES

Crankshaft Grinding at Ford's Lima Engine Plant 24

Completely automatic crankshaft grinding lines demonstrate efficiency and safety of the newest Ford engine plant. By M. M. Patterson.

A Guide to Rough Grinding Carbide Tools 28

Even "rough" grinding of carbide tools is a precision operation. Article includes answers to the nine most frequently asked questions and a guide page for easy reference. By Richard A. Parke.

Better Diamond Dressing for Precision Grinding 32

Experimental results emphasize importance of sharp diamonds, rapid dress lead. By H. B. Patterson.

Continuous Blasting Boosts Production, Cuts Handling 35

Single 72-inch diameter barrel, with conveyors, replaces seven tumbling mills, two large batch barrels, can clean up to 16 tons of gray iron castings per hour at Milwaukee Works of International Harvester.

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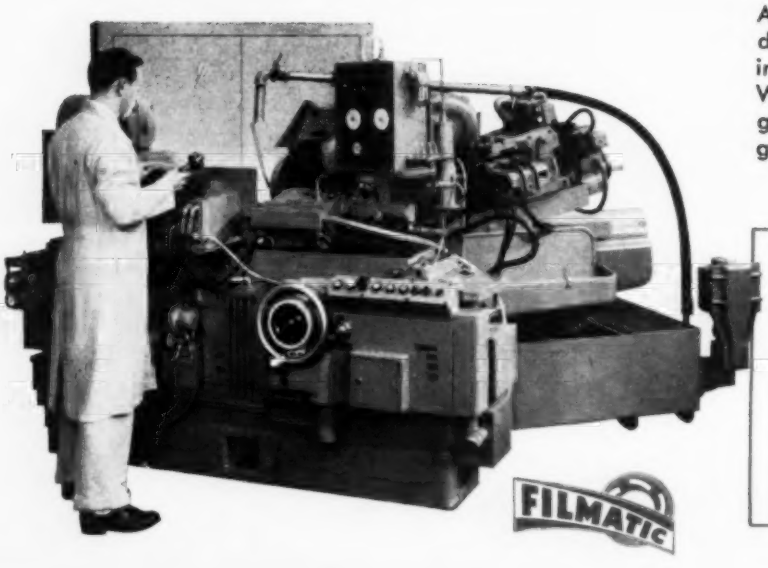
CINCINNATI FILMATIC Angular



Automatic sizing and flagging combined are indicative of the cost-reducing ideas incorporated in a CINCINNATI FILMATIC 10"R x 18" Angular Wheel Slide Grinding Machine, tooled up to grind the diameter and adjacent face on drive gears in one automatic cycle.

CINCINNATI FILMATIC 10"R x 18" Angular Wheel Slide Grinding Machine. Range and sizes listed below. Write for catalog No. G-686-1.

Size	Between-Center Lengths	Wheelhead Drive
6"R / 10"L	18" and 30"	7½ hp
10"R / 14"L	18", 36", 48" and 72"	15 hp

Sweet's Machine Tool File contains brief specs.

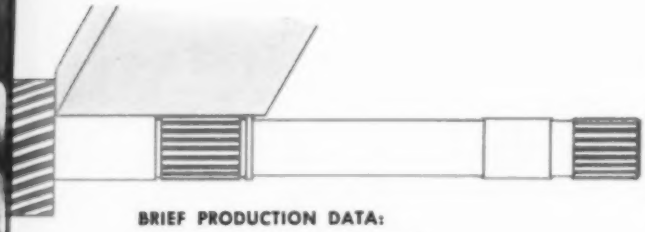
CINCINNATI®

CENTERTYPE GRINDING MACHINES • CENTERLESS GRINDING MACHINES
MICRO-CENTRIC GRINDING MACHINES • CHUCKERS

Wheel Slide Grinders

combine diameter and shoulder operations, and give you 16 additional feature-advantages

Big reductions in cost often are attained by combining operations. Consider precision centertype grinding, for example. CINCINNATI FILMATIC Angular Wheel Slide Grinders combine two or more diameter and shoulder grinding operations into one rapid automatic cycle. In addition, these fine precision grinding machines offer the 16 additional advantages tabulated at the right. ¶ An example of a typical part ground on a CINCINNATI is illustrated below, and a close-up of the operation is shown at the left.



BRIEF PRODUCTION DATA:

Part Name	drive gear
Material	steel
Operation	grind diameter and adjacent face as illustrated
Stock Removal	.010" max.
Production Potential	up to 100 per hour

A second machine grinds the other side of the gear and the diameter adjacent to it. These machines, tooled up by Cincinnati Grinding Specialists, are indicative of the way in which Cincinnati can help you reduce costs through direct replacement and/or improved methods. Want to know more? Let us hear from you. Meanwhile, you might want to look at brief specs on the entire Grinding Machine Division line in Sweet's Machine Tool File.

CINCINNATI

1 FILMATIC bearings for the grinding wheel spindle

2 Automatic grinding wheel balancing

3 Push-button automatic infeed cycle

4 Automatic hydraulic table clamp

5 *Automatic air-electric gage sizing. Cycle time stabilizer included

6 *Automatic gap eliminator (minimizes time spent in "cutting air")

7 *Behind-the-wheel profile truing

8 *Manual or automatic flagging

9 Sizing adjustment dial graduated in increments of .000050"

10 Coarse and fine feed rates incorporated in automatic grinding cycle

11 Easy to set up and operate

12 Roll-out cutting fluid tank

13 Independent hydraulic tank and pump

14 All V-belt headstock drive

15 Automatic filtered pressure lubrication

16 Heavy, well proportioned castings made in our own foundry

*Equipment available at extra cost

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Using a jig borer index table with the Vulcanaire 5 indexing holes and 35 locating and clamping holes were JIG GROUND in place. Result – eliminated all close locating and dowelling of individual parts and of course hours of time.

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Letters to the Editor

RCA Automatic Grinder Control

Could you advise me how to get in touch with the manufacturer of the RCA automatic grinder control which is described in September issue of GRINDING and FINISHING, page 42. (Telegram)

A. R. Warner
Latrobe Steel Co.
Latrobe, Pa.

I have been looking at the article, "Automatic Grinder Control to Millionths," in your September 1958 issue of GRINDING and FINISHING, and would like to obtain more data on the equipment used in this particular article.

You state the RCA control system, but do not mention who manufactures the item. Would you kindly let us have this information at your earliest convenience.

Alec Sonis
Wendt-Sonis Co.
Hannibal, Mo.

Cleaning of Grinding Coolants

We are particularly interested in the following paper which appeared in your journal for March 1958 about "Cleaning of Grinding and Finishing Coolants" by A. L. Wilson.

We should like to photocopy this and send copies to a few of our members who are interested. Would you give your permission for this please, providing, of course, that due acknowledgment is given and that copies are distributed free of charge.

E. A. Oldfield
Cutlery Research Council
Sheffield, England

Surface Finish

While scanning through a copy of GRINDING and FINISHING dated September, 1956, I found an article of great importance and interest. The title is "Surface Finish" by R. E. Reason, Director of Research for Taylor, Taylor and Hobson, Ltd., Leicester, England. Parts two and three of the above article were to be printed at a later date.

Would it be possible to obtain a copy of the complete set. If so, please notify me.

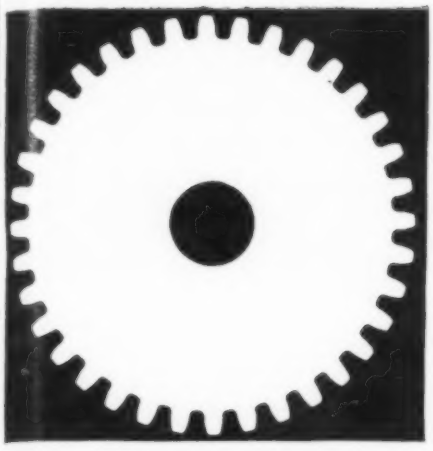
Your cooperation on this subject is greatly appreciated.

E. Millette
The Bullard Co.
Bridgeport, Conn.

Manufacture of Grinding Wheels

We have seen a reprint of an article entitled, "Raw Materials Testing–The First Step in the Manufacture of Today's Grinding Wheel–Part 1," by James R. Gilman of Bay State Abrasive Products Co. and would greatly appreciate receiving two copies of the complete series of articles. Kindly advise us the cost of these reprints.

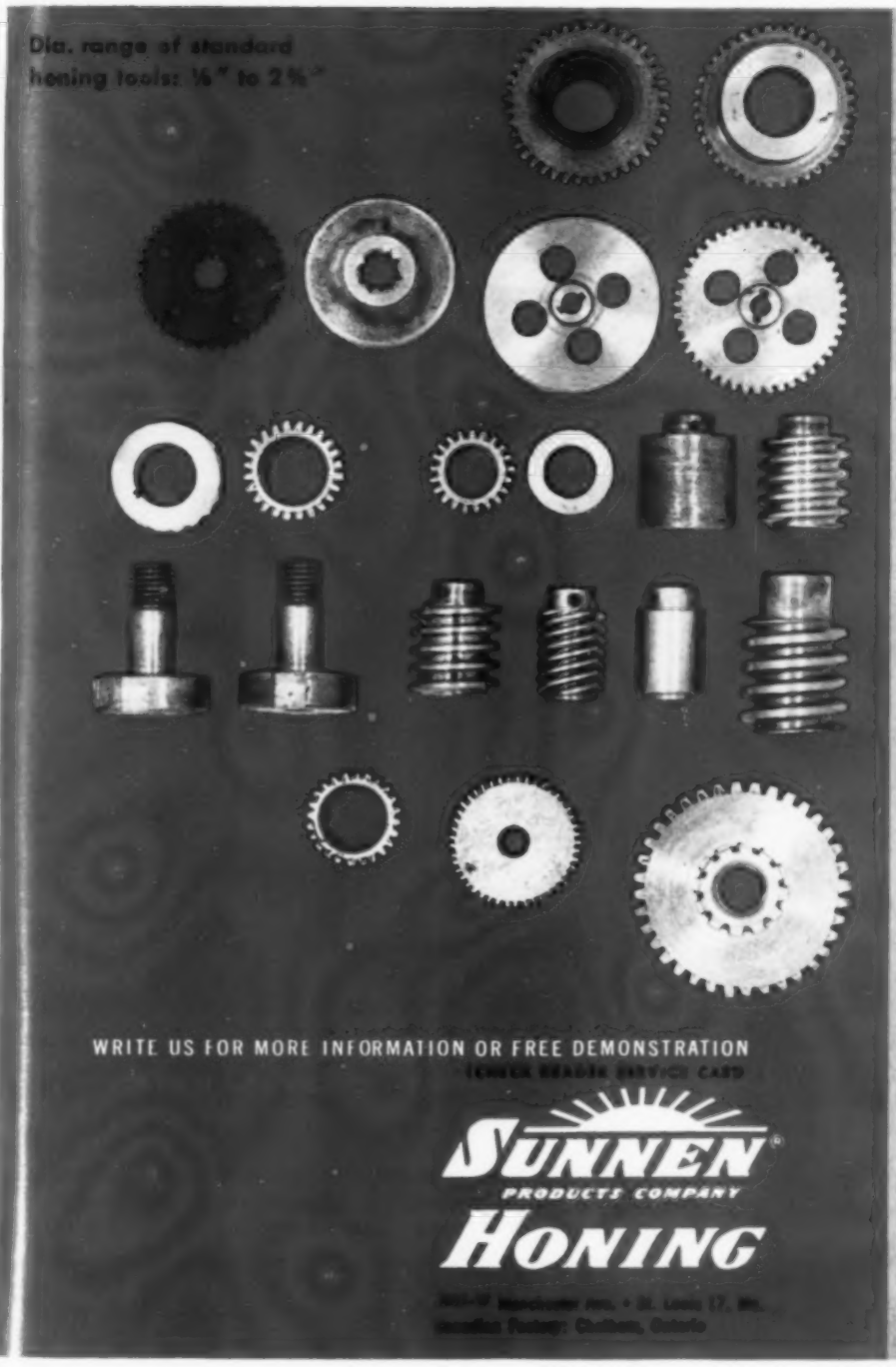
L. M. Diedrichs
Ferro Corp.
Cleveland, Ohio



CUT YOUR TOOLING COSTS

AND INCREASE PRODUCTION

of bores in small parts



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Results: Higher production rates, guaranteed accuracy to a tenth and surface finish as fine as 2 micro-inches.

Sunnen Honing requires no fixturing or expensive set-up time. You change from one size to another in a minute.

Average machine installation with tooling runs about $1,000. Why not investigate the advantages of Sunnen Honing for your plant? You'll find it one of the best investments you can make.

7747

wherever abrasive operations are performed

Grinding and Finishing Around the Country

Three Brackets Anchor 15,000 Lb. Thrust

Three small metal brackets, made from Allegheny Ludlum Steel Corp.'s special alloy A-286, ties 10,000 lb. and 15,000 lb. thrusts down.

The special bracket, which holds the engine in place, is forged into an unusual shape shown in the inset. Engineers at Convair in San Diego, Calif. call this a "dog-leg." The inset shows the bracket on the F-102A, which has a J-57 engine and a 10,000 lb. thrust.

Convair's new F-106A Delta Dart, the world's fastest and highest flying all-weather interceptor, is shown.

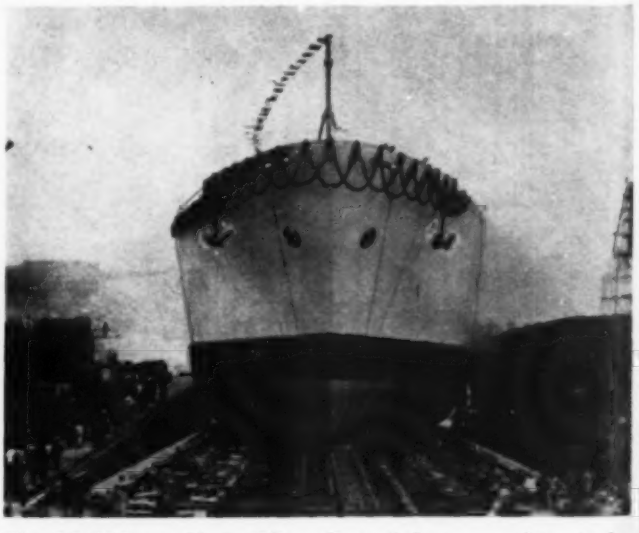
The superalloy used in the brackets is noted for its corrosion-resistance, heat-resistance, and strength at elevated temperatures. It is most widely used in jet engines, gas turbines, and turbo-superchargers. •

Audio Worker Instruction System

The Dictaphone AIMO (audio instructed manufacturing operation) of providing taped voice instructions, rather than printed words or diagrams, to manufacturing workers is now in commercial production and will be available shortly from Dictaphone Corporation. The system was developed by Dictaphone in cooperation with Westinghouse Electric Corporation.

Two new Dictaphone machines form the essentials of AIMO. The recording unit is used to put voice instructions on tape for later playback to the operator. An indication button on the microphone allows the instructor to give "blocks" of information, one block at a time, for easy assimilation by the operator.

The illustration shows the operator listening to pre-recorded instructions, step-by-step, via the reproducer, with a tiny transistor receiver on her belt, and the Magic Ear listening device. By touching one tube with her foot, the operator gets the next step—a touch of the other gives a repeat. The job pictured is a wire assembly operation. A standard Time-Master head set, or external loud speaker, can also be used with the reproducer, depending on the size of the operation. •



The 22,600 ton M. S. Olin—first of three ore ships to be built for service between Surinam, South America, and the U.S. Gulf Coast—is shown being launched from Hamburg, Germany, Sept. 20. The ship will carry bauxite to Burnside, La. for the aluminum operations of the Olin Mathieson Chemical Corp. Alumina from the Burnside plant will be carried to the Hannibal, Ohio, reduction plant. The two plants are owned and operated by Ormet Corp., which is jointly owned by Olin Mathieson Chemical Corp. and Revere Copper & Brass Inc. By 1960 about 700,000 tons of bauxite will be carried each year by the three ore ships. •

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All standard shapes, sizes, diamond depths and concentrations . . . man-made or natural diamonds in resinoid and vitrified bond. Natural diamonds also in metal bond.

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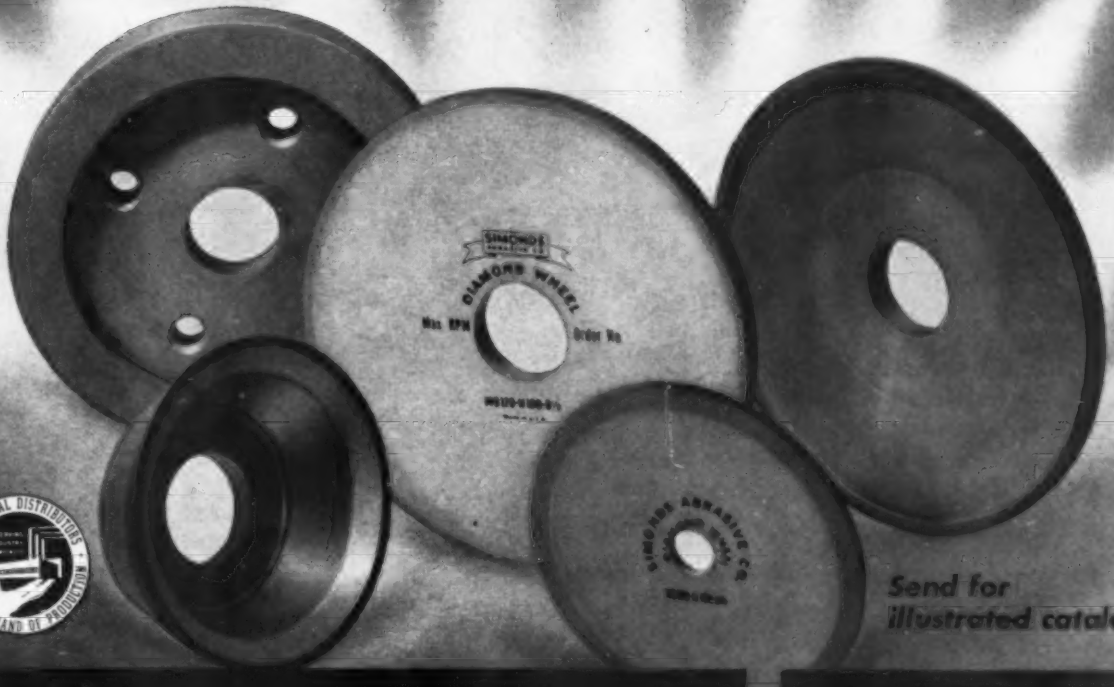

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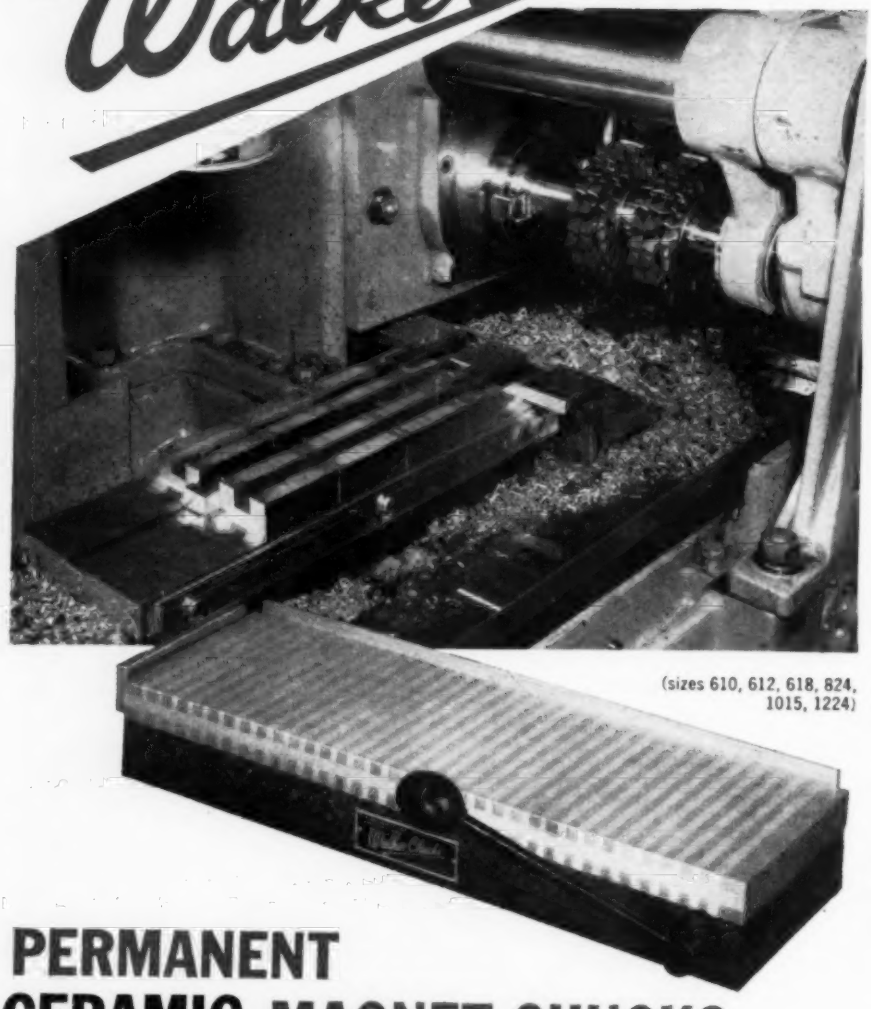

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Abrasive Compounds Ground To 2 Micron Particle Size

Micro Metals Corp., Paterson, N.J. can now grind tonnages of Ferrite and abrasive compounds to a two micron particle size and non-abrasive materials to sub-micron particle size. This opens the door to better products and more consistent production in the field of metallic molding.

Micro Metals have now installed the specially developed equipment needed and are making sample runs of metallic and abrasive materials for interested manufacturers, as well as experimenting with new materials. •

Plastic Capsule Holds Stephen Foster Tribute

A cylinder to be sealed in the cornerstone of a new Kentucky amphitheater near the site where Stephen Foster was inspired to write "My Old Kentucky Home" (Bardstown, Ky.) is believed to be the first "time capsule" ever made of a non-aging material called unplasticized polyvinyl chloride.

The cylinder contains tributes to the famous composer by President Eisenhower and other leading figures. It was provided by Carl B. McLaughlin, Executive Vice- President of Tube Turns Plastics, Inc., Louisville, Ky. •

Philco Forms Advanced Weapon Systems Group

A new advanced weapon systems (AWS) group has been formed by Philco Corp.'s (Philadelphia) Government and Industrial Division. Hayden N. Ringer has been promoted to Manager of the new group.

S. C. Spielman, Director of Engineering for the Division, explained that the objective of the group will be to study and formulate new and advanced weapon systems to meet future military requirements. •

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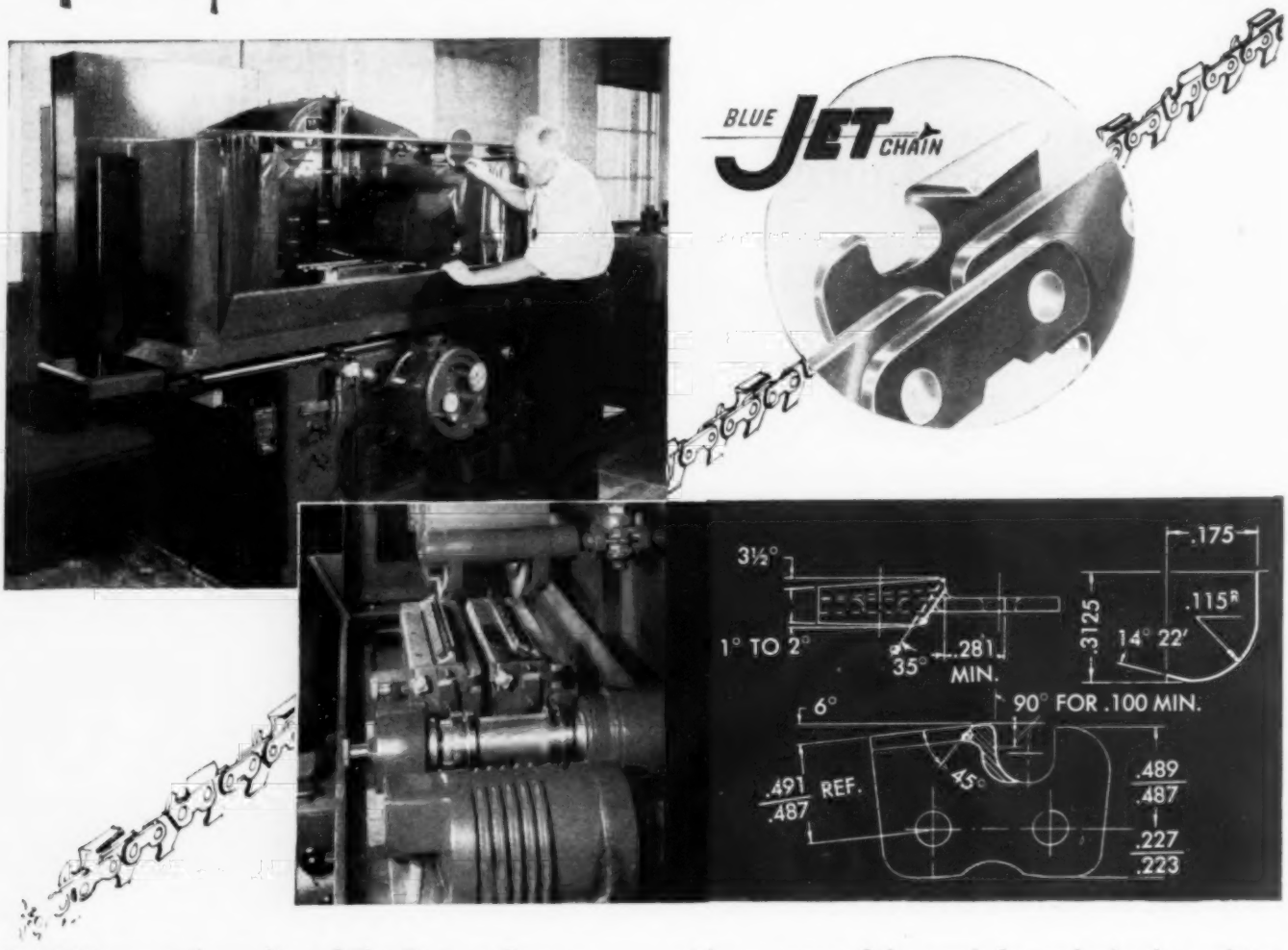

For 140 years, the policy of The Draper Corporation of Hopedale, Mass., has been to offer the highest quality product at the least possible cost.

Following this policy, its subsidiary, BlueJet Corporation, manufacturers of the famous BlueJet saw chain, installed a Thompson Truforming grinder to grind the cutting edges on their chain saw routers. These routers were formerly ground, piece by piece, by a force of 8 employees.

The Thompson Truforming operation is now cutting former grinding costs by 60%. 3 men only are now required for the operation. 40 L.H. and 40 R.H. routers are now ground simultaneously with one pass of the crush formed wheel, resulting in a day's production of over 12,000 pieces—many times that produced by the former method. Both the uniformity and sharpness of the routers have been greatly improved.

For 25 years, Thompson has pioneered and developed the modern advances in crush form grinding. If you have a time-saving, product-improving or cost-cutting problem in your operations, it will pay you to investigate the work Thompson Truforming grinders are now doing in plants all over the country. Our engineering experience is available to you without obligation. Write for Catalog T558.

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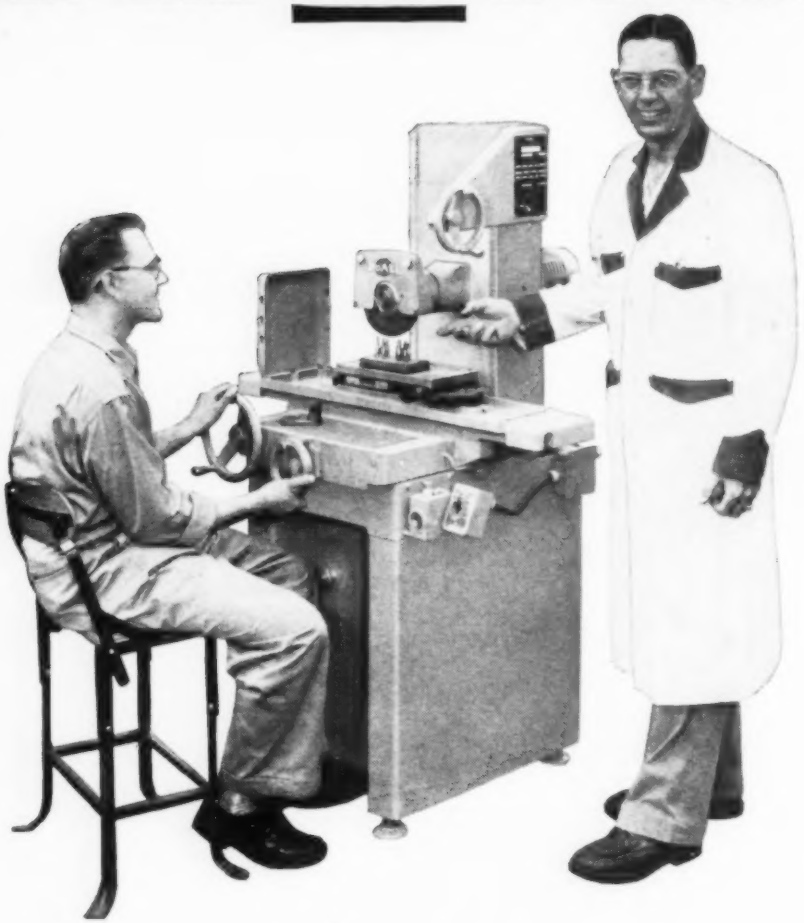


Anyone becomes an *expert* in a *hurry*... with DoALL's new DH-612 surface grinder

Now you can handle those difficult grinding jobs with greater ease and precision than ever before!

Never have you seen a hand grinder with so many time-saving, work-improving advantages. This all-new DoALL suits the convenience of any man in your shop. Legs adjust to the tallest or the shortest. Table drive quickly switches to left- or right-hand operation. Controls are reached without stretching—even while sitting. Knee-recessed cabinet provides solid comfort through the longest jobs without cramping and fatigue.

Here, too, is steady, more precise grinding action with the extra-large, super-precision spindle. Table climb is eliminated with the powerful, velvet-smooth cog belt drive. And to insure DoALL high-quality work standards—rigidity throughout! Castings are heavier and bearing areas are larger than in any other hand grinder known. A complete line of accessories, including "Cool Grinding" coolant system, provides greatest utility.

In ease of operation, accuracy and versatility, there is no finer grinder—at any price. Phone your local DoALL store for a free demonstration. Or write:

Look at these outstanding DoALL features

- Adjusts to fit any operator
- One-shot lubrication system
- Vertical feed handwheel graduated in tenths
- Extra-large 1 h.p. spindle with anti-friction bearings
- Saddle lock for form and plunge grinding
- Telescoping dust guards
- Full range of optional equipment: Zero slip rings on vertical handwheel; through-the-wheel mist coolant system; hydraulic table drive, etc.
- Table travel: 7" x 13"; work height: 0 to 12-¾"; vertical feed to .0001"; cross-feed to .0002".

GR-27

The DoALL Company, Des Plaines, Illinois

THIS IS A TYPICAL DoALL STORE

wherever abrasive operations are performed

News of Metalworking

Peaceful Uses Of Atomic Energy

GENEVA, SWITZERLAND—The largest display ever assembled on peacetime applications for atomic power was put on view Sept. 1-14 during the Second United Nations International Conference on the Peaceful Uses of Atomic Energy.

Among the half a hundred American exhibitors, which included government agencies, educational organizations and private companies, was The American Potash & Chemical Corporation. The firm displayed the well-known boron and lithium, as well as the lesser-known cesium, rubidium, thorium and yttrium, and the so-called rare earths, gadolinium, dysprosium, erbium and other products used in the industrial nuclear field.

S. Becker Treat, Vice-President of AP & CC's Lindsay Chemical Division in charge of sales, predicted that major progress in peacetime application for nuclear energy would be made in Europe rather than the United States. The United States is not pressed to develop new sources of power as we are extremely rich in low-cost conventional fuels such as gas, coal, and oil, Treat said. •

Steel Output Upped For '59

NEW YORK—Armco Steel Corporation Executive Vice-President Logan T. Johnston, in an address before the National Industrial Conference Board marketing session at the Waldorf Astoria Hotel, predicted that the nation's steel industry would produce about 25% more steel in 1959 than in 1958. Johnston forecast a steel demand next year of about 108 million tons. This production means the steel industry would be operating about 75% of its estimated 1959 capacity, he said. Steel needs in the automotive, construction, appliance, machinery, railroad, and agricultural markets were expected to be higher next year. •

New Types of Synthetic Rubber Developed

DETROIT: George M. Konkle, of the Dow Corning Corporation, described newly-developed types of silicone rubber at the semi-annual meeting of the American Society of Mechanical Engineers. Among them, he said, is one which has three times the tensile strength and four times the elongation of the first varieties of silicon carbide.

Airplane tires immune to the heat generated in supersonic flight are now being made of this kind of synthetic rubber. The rubber has a number of unusual properties, the most important of which is resistance to heat and cold, while still retaining its strength. •

Detroit Electric Furnace Conf. Dec. 3-5, 1958

NEW YORK: The Sixteenth AIM Electric Furnace Conference will be held at the Statler Hotel, Detroit, December 3-5. The AIME Electric Furnace Steel Committee has added the production of ferro-alloys and calcium carbide to its technical scope and has revealed that its name, accordingly, has been changed to omit the word "steel." The Electric Furnace Committee is part of the Iron and Steel Division of The Metallurgical Society, a constituent unit of the American Institute of Mining, Metallurgical, and Petroleum Engineers.

KEEPS CUTTING FLUIDS
AS FRESH AS A DAISY

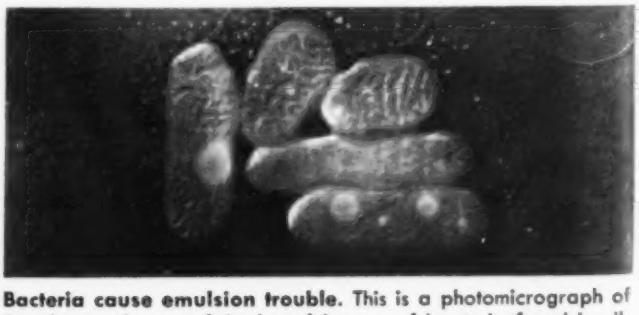
Here's why ELCIDE 75™ can increase the useful life of your soluble oil emulsions

Elcide 75 controls harmful bacteria that enter all oil-water emulsions and cause rancid odor, acidic corrosion, and emulsion breakdown. Prior to the development of Elcide 75, certain bacteria developed immunity to commonly used germicides, and no single inhibitor could control their damage.

Elcide 75 is a combination of proven anti-bacterial agents, including one of the safest and most powerful bacterial inhibitors used in the exacting field of medical surgery today.

Elcide 75 is not a "built-in additive" that is weakened by larger emulsion ratios. With Elcide 75 you know you have an effective, safe treatment because you add it to the emulsion right in your own plant.

Elcide 75 is completely safe for employees, machinery, and products. Not only is it non-toxic and harmless to sensitive skin, but its anti-bacterial action reduces the chance for infection caused by contaminated emulsions. The use of Elcide 75 also reduces the acidic corrosion caused by bacterial decomposition.



Bacteria cause emulsion trouble. This is a photomicrograph of *Pseudomonads*, one of the harmful types of bacteria found in oil-water emulsions. They enter the emulsion through the air, water, and plant debris, and make it possible for sulfate-reducing bacteria to cause odor, corrosion, and emulsion breakdown. Elcide 75 controls a much wider range of these and other types of damaging bacteria.

WHAT ELCIDE 75 MEANS TO THE METALWORKING INDUSTRY...

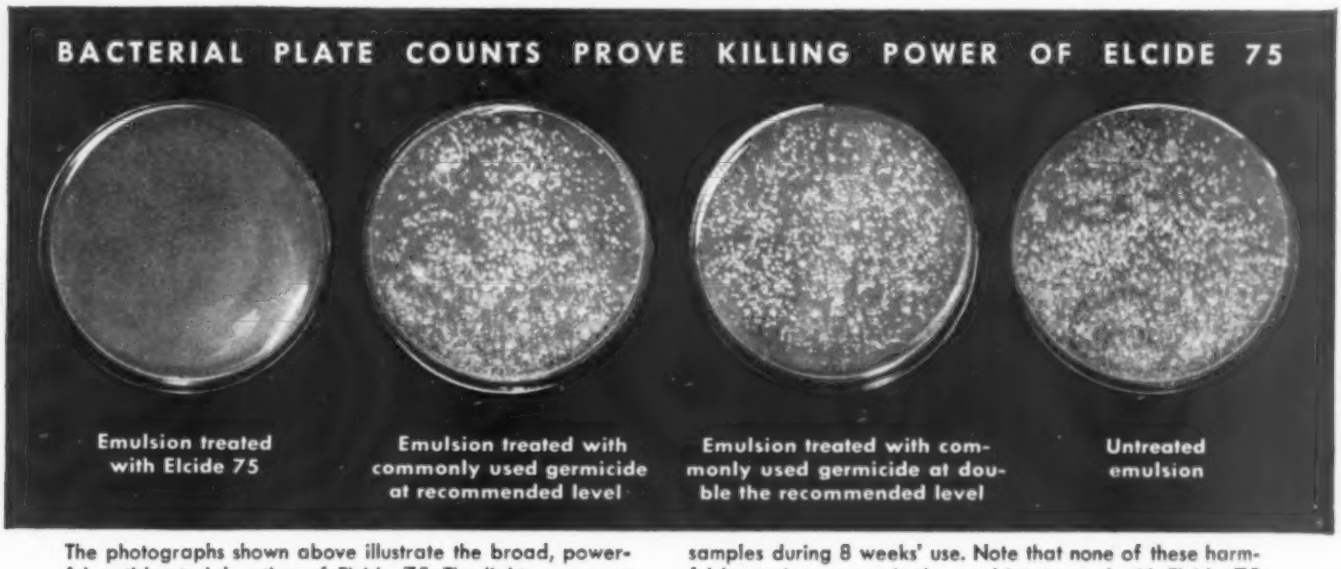
Operating costs can be greatly reduced because of Elcide 75. This saving is an accumulation of several important benefits.

Actual shop tests have shown that one ounce of Elcide 75 added to each four gallons of emulsion can keep the oil-water emulsion fresh as much as 5½ times longer. In one test, emulsions that normally had to be dumped at the end of four weeks ran for 22 weeks when treated with Elcide 75!

You can benefit by three direct savings—costly labor and down time for recharging will be reduced, your soluble oil requirements will drop, and the disposal cost of spoiled emulsions will diminish.

Elcide 75 also contributes to better products and longer machine tool life because it controls the bacteria which often cause acidic corrosion.

You can have a cleaner plant by using Elcide 75. It eliminates objectionable odors as well as bacteria that may cause skin infection. Elcide 75 is nontoxic and safe to use, as proved by tests conducted under normal shop conditions.


BACTERIAL PLATE COUNTS PROVE KILLING POWER OF ELCIDE 75
Emulsion treated with Elcide 75
Emulsion treated with commonly used germicide at recommended level
Emulsion treated with commonly used germicide at double the recommended level
Untreated emulsion

The photographs shown above illustrate the broad, powerful anti-bacterial action of Elcide 75. The light areas are bacterial colonies that have grown in three of the emulsion samples during 8 weeks' use. Note that none of these harmful bacteria appear in the emulsion treated with Elcide 75 during the same 8-week period. The emulsion stayed fresh.

PUT ELCIDE 75 TO WORK FOR YOU

The best way to determine the value of Elcide 75 to your own operation is to try it under normal plant conditions, using your regular oil-water emulsion. After you compare the costs of operation, you will agree that Elcide 75 is a valuable discovery that deserves a permanent place in your plant. Why not try Elcide 75 soon?

ELCIDE 75™
PATENT PENDING
Lilly

PRODUCT SPECIFICATIONS
ELCIDE 75

(Lilly's brand of bacterial inhibitor for cutting fluids)

Active Ingredients—Sodium Ethylmercuri Thiosalicylate (Thimerosal) and Sodium *o*-phenylphenate.

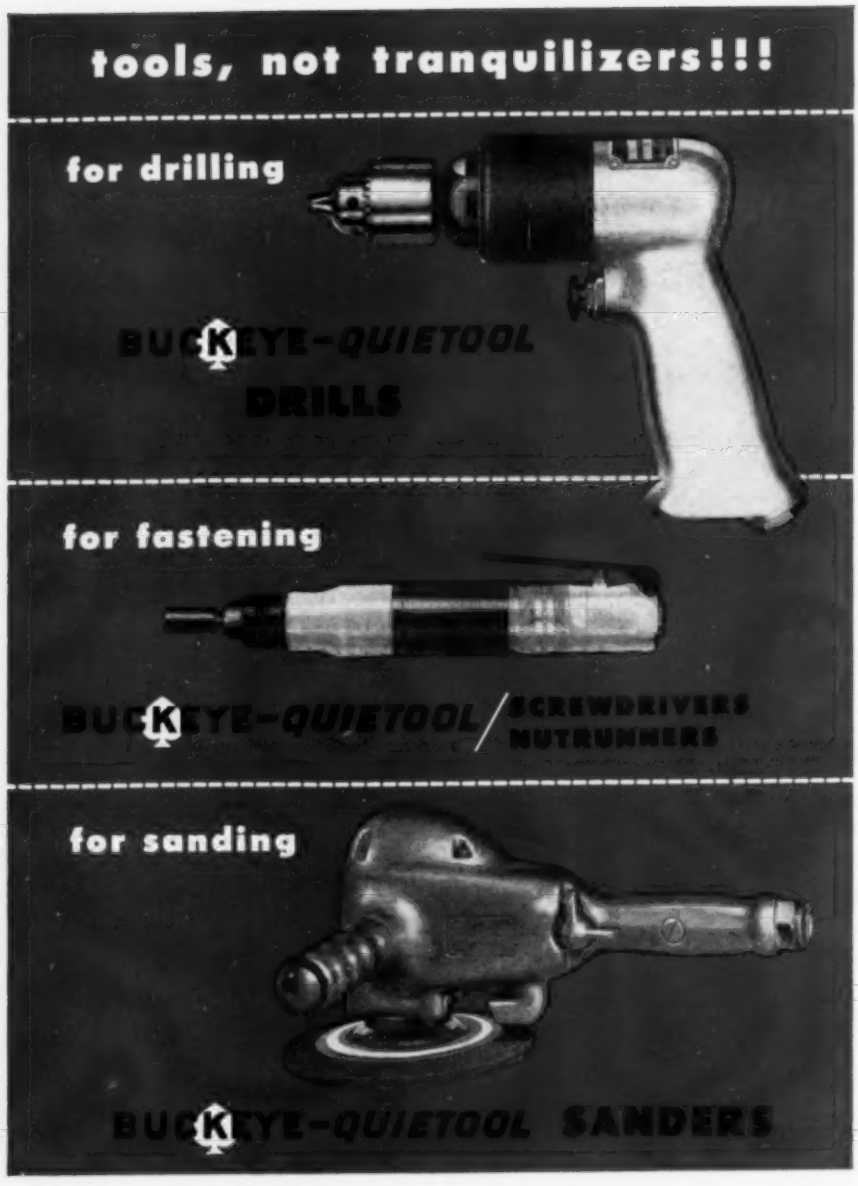
Package	Price per Gal.
1-gallon polyethylene	$8.50
5-gallon polyethylene	$8.00
55-gallon stainless steel	$6.50

This product is sold only through selected distributors.

For further information or to place your order, write or phone:

ELI LILLY AND COMPANY, AGRICULTURAL AND INDUSTRIAL PRODUCTS DIVISION, INDIANAPOLIS 6, INDIANA

TELEPHONE: MElrose 6-2211



Air tools are built for working, not for sleeping. Even the amazingly muffled Buckeye QUIETOOL drills, sanders, screwdrivers and nutrunners won't lull you to sleep! But they do their work with precise efficiency, and make less exhaust noise in the process than you ever believed possible of an air tool.

How come? Because in designing these new tools, we included the muffler as an integral part, designed into the tool from the start.

There are many more reasons why these new Buckeye tools operate so quietly, stuff about decibels, sones, microbars, etc. . . . but you'll be more interested in the results than in how we came by them.

A letter or postcard, with your name, your company name and address, and the single word QUIETOOL, will bring complete information and, if you like, an obligation-free trial-test right in your own plant.

Why AIR Tools?

Because air is everywhere, just waiting to be put to work . . . because continuous operation can't possibly harm an air tool . . . and because, if you're using Buckeye air tools, you can almost forget about tool maintenance.

For a special air tool for a difficult job, or a standard air tool for routine work, your best buy is Buckeye. Write for our new catalog.

Buckeye Tools
CORPORATION
8018 SPRINGBORO PIKE • DAYTON, OHIO

News of Metalworking . . .

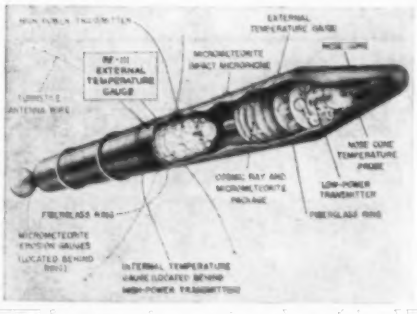
Standard On Tapping And Drive Screws

NEW YORK—American Standard B18.6.4-1958, "Slotted and Recessed Head Tapping Screws and Metallic Drive Screws," has just been approved by the American Standards Association and published by The American Society of Mechanical Engineers.

Two other sections that were originally part of American Standard B18.6-1947 have already been published in 1956 as separate standards. They are: American Standard B18.6.1-1956, Slotted and Recessed Head Wood Screws, and American Standard B18.6.2-1956, Hexagon and Slotted Head Cap Screws, Square Head Set Screws, and Slotted Headless Set Screws. One more standard is still in preparation and expected to be published in three to four months. It is American Standard B18.6.3, Slotted and Recessed Head Machine Screws and Machine Screw Nuts.

The B18.6 series of standards can be ordered from American Standards Association, 70 East 45th St., New York 17, N.Y., or from The American Society of Mechanical Engineers, 29 West 39th St., New York 18, N.Y., at the following prices: B18.6.1, $1.00; B18.6.2, $1.50; B18.6.4, $4.00. •

When Explorer I blasted off from Florida's Cape Canaveral, the RF-11 thermistor used for sensing outer



skin temperature was an important small part relaying back essential data. It had been installed amidship the last-stage motor case of the satellite. Barely over half an inch long and 0.112" thick, the thermistor is a standard product of General Electric Co.'s Magnetic Materials Section, Edmore, Mich. It will sense external temperatures up to 750° F. •

He's equipping this machine with the "Touch of Gold"

Grinding is always a profit-producing step in metal working. That's why the grinding wheel itself is so important — and why Norton world leadership in grinding is important to you when you specify grinding wheels.

Because a Norton wheel, contacting the work in process, is always adding the "Touch of Gold" . . . creating value and usefulness through improving the fit and finish of the product. The right wheel for each job is the key to having each job done right . . . which is the real secret of profitable production. And Norton stocks more than 200,000 types and sizes of grinding wheels to make your "Touch of Gold" quickly available. Plants and distributors all around the world.

NORTON COMPANY, General Offices, Worcester 6, Massachusetts.

NORTON
ABRASIVES

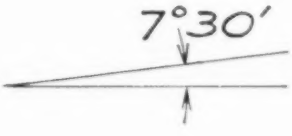
Making better products . . . to make your products better

This is a knock-out cavity bushing.

It is used in plastic injection molding.

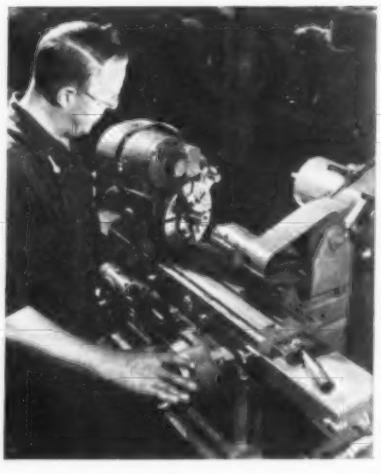
It is manufactured by *FASTEX*,

Division of Illinois Tool Works, Des Plaines, Illinois.

It has a 

internal taper.

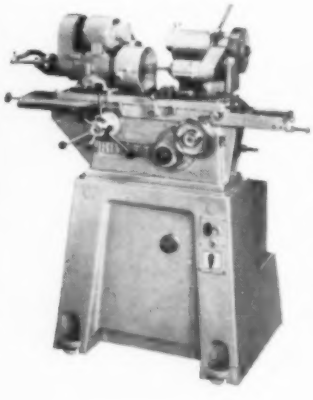
It is ground from hardened tool steel, 58-60 Rockwell C



The tolerances must be held to 0.0002"

The grinder on which this bushing and all its cousins are made is a

RIVETT
MODEL 84



Model 84
An internal specialist with external ability. Mounts interchangeable wheelheads for internal and external spindles. Capacities are 3" diameters, depth 4". Collets and step chucks mount directly in lathe-type spindle.

RIVETT LATHE & GRINDER, Inc.
DEPT. GF 11. BRIGHTON 35. BOSTON. MASS.

Largest Galvanizing Kettle

COATESVILLE, PA.—The world's largest galvanizing kettle, 40'2" long x 51" wide x 6'10" deep, has just been built by the Lukenweld Division of Lukens Steel Co. here for Valcon Galvanizing, Inc., of Natrona, Pa. Now even the biggest steel members can be brought straight up out of the kettle for draining "the long way" to give the smoothest possible zinc finish.

Scheduled for processing as soon as installation is completed are large steel trusses, pipe, and plates, as well as oil derricks, tanks, grating, chains, bars, expanded metal, structurals, and other steel items. •

Steel Keeps Wells From Running Dry

MASSILLON, OHIO—Filter screens that do not corrode over long periods of service are being made of stainless steel to permit continued flow of water into large industrial and municipal water wells, according to engineers of Republic Steel Corporation.

The Ohio Drilling Co., also of Massillon, pioneered the new use for the stainless steel—Republic Steel's Type 304. The company's well diggers sink the filter screens as sidewalls for the water reservoir in large capacity wells. Then they pack a clean gravel fill around the screen. The water flows into the well from the surrounding soil, through the fill, and through the slots in the screen. •

"The Tool & Die Makers Surface Grinder"

Harig's NEW TML 6x12 SURFACE GRINDER

THE NEW TML BY HARIG PROVIDES EXTREMELY FAST AND ACCURATE GRINDING—STURDY CONSTRUCTION—ADVANCED DESIGN WITH ECONOMY IN MIND. . . *THE LOW COST WILL PLEASE YOU!*

OUTSTANDING FEATURES

- Solid one piece construction of spindle housing and vertical slide.
- Elevating screw centrally mounted.
- Combination "V" and flat ways assure positive alignment.
- Angular rack and pinion mounting distributes wear equally along rack and pinion face.
- Motorized Spindle, dust collector and water unit available.

SPECIFICATIONS

Longitudinal Travel	12-3/8"
Cross Feed Travel	7"
Vertical Working Height (Under 7" dia. wheel)	0" to 12-3/4"
Platen Working Area	6" x 12"
Grinding Wheel	7" x 1/2" x 1-1/4"
Elevator Handwheel Graduation	.0005
Cross Feed Handwheel Graduation	.001

Remember: Harig's Famous Precision is in Evidence Throughout!

Harig's IMPROVED Grind-All FIXTURE

"The Latest Advancement in Perforator Grinding"

Fast, accurate perforator grinding fixture — hand crank for easy rotation of index plate, single locking screw for making quick set-ups. Easily grinds irregular shaped perforators concentric with shank within ±.0002 accuracy. Also can be used as milling, boring and inspection fixture. NEW! RADIUS DRESSER ARM—attachment makes Grind-All Fixture a highly accurate radius dresser.

made by the house that precision built!

Harig Manufacturing Corp

5769 W. Howard St. - Chicago 31, Ill.

HOW TO SAVE MONEY AND TIME ON SPINDLE REPAIRS

Make POPE *Your Spindle Repair Department*

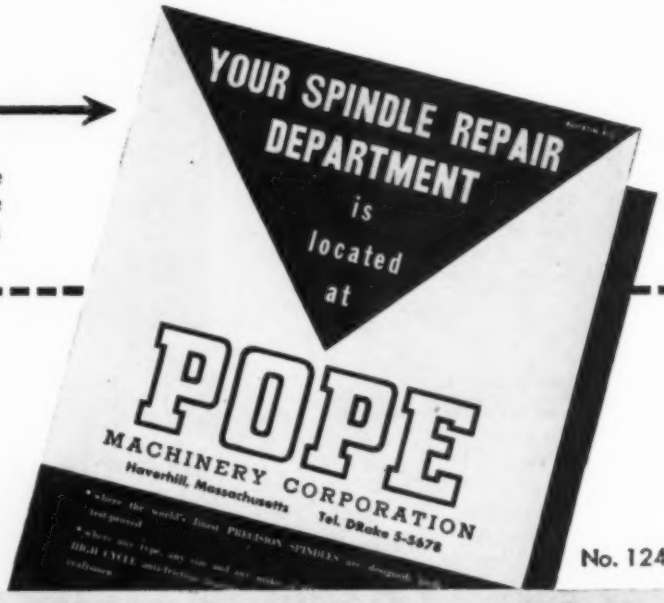
POPE Repair and Rebuilding Service applies to any size, any make of anti-friction bearing Spindles — belt driven, motorized or high cycle.

POPE puts your Spindles in shape *quickly*, at lowest cost. *You* okay the cost figures before the work is done.

POPE repair work is done by the same expert craftsmen that build Pope Precision Spindles, and in the same air cleaned, air conditioned assembly department. The job will be done *right* the first time — *right* bearings, *right* preload, *right* lubrication, *right* assembly, *right* balance.

GET THIS!

Bulletin R-2 tells you *how* and *why* Pope Precision spindle repair and rebuilding service save you money and time. Clip the coupon and get a copy by return mail.



No. 124

POPE MACHINERY CORPORATION
261 River St., Haverhill, Massachusetts
Please mail copy of Bulletin R-2 to:

Name .....
Company .....
Address .....
City ..... *Zone* .... *State* .....

POPE®

ENGINEERS AND BUILDS STANDARD AND SPECIAL PRECISION ANTI-FRICTION BEARING SPINDLES FOR EVERY PURPOSE

POPE MACHINERY CORPORATION • 261 RIVER STREET • HAVERHILL, MASS.

Established 1920

Headway Construction features dovetail mounting . . . elevating screw mounted both top and bottom
Work height . . . a full 12½" from the top of the table to the underside of the 7" wheel
Neg'ator stainless steel roll type dust guards
Cross Slide Lock . . . standard equipment
One-Shot Lubrication system by Bijur — standard equipment
Handwheels . . . located at operator's fingertips for easier operation. 9" diameter table handwheel.
Smoother running timing belts to effect table movement
Table and Cross Slide ways completely protected by new underguarding
Heavy construction — for uniformity and vibration-free performance
Head elevating hand wheel finely graduated in .0005 increments — .050 per turn
PRECISION SURFACE GRINDERS
REID
612
PRECISION SURFACE GRINDER

ACCURATE . . . LOW COST . . . PRECISION GRINDING! The Reid 612 surface grinder is the **newest** in a long line of precision machine tools. Nearly 60 years of manufacturing experience is reflected in this outstanding machine. Here is a toolroom grinder which is substantially heavier than comparable grinders in the 612 class and offers many exclusive features.

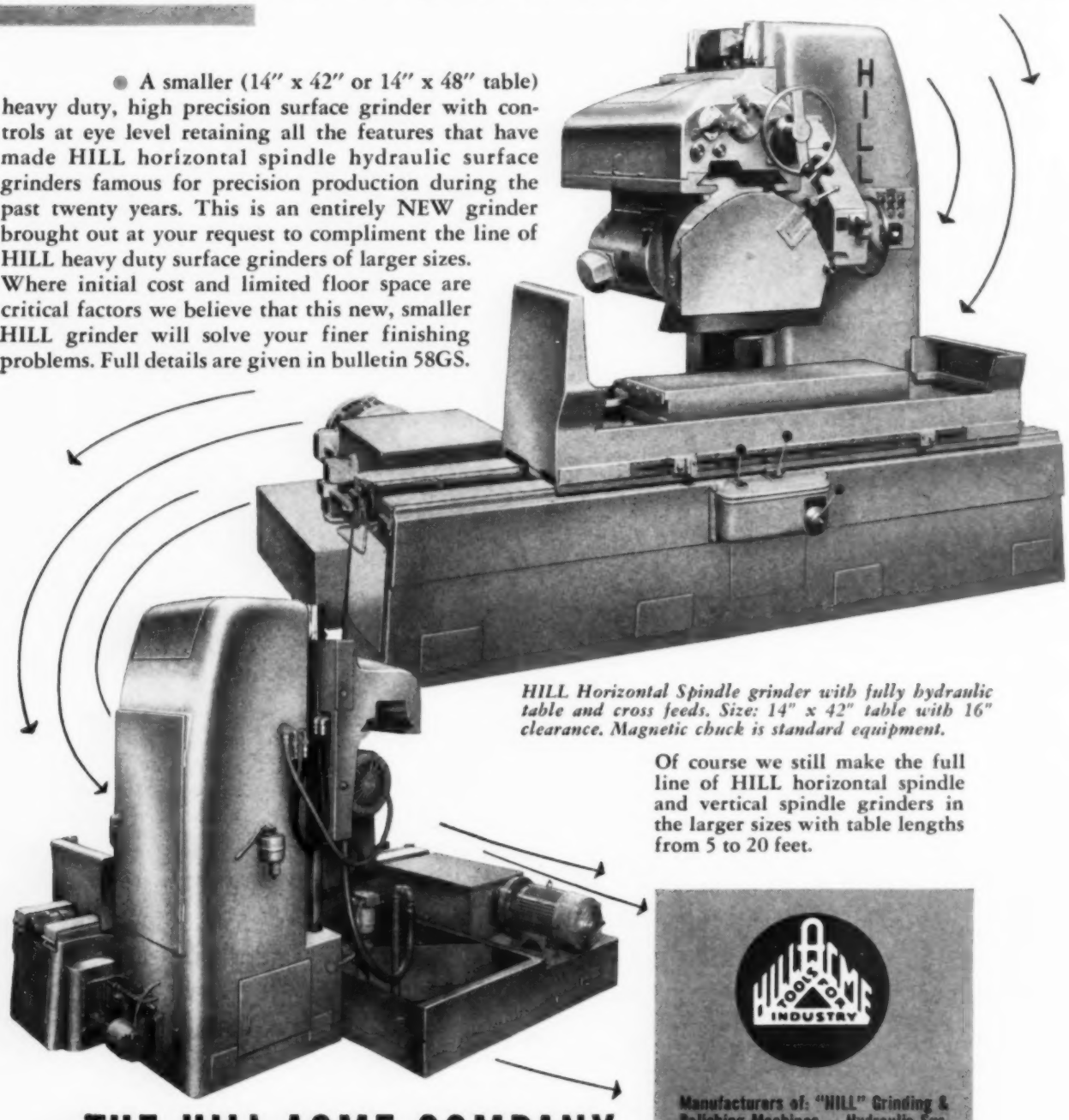
See the Reid 612 in action . . . Ask your dealer for a demonstration.

REID PRECISION SURFACE GRINDERS

REID BROTHERS COMPANY, INC. / 138 ELLIOTT ST. / BEVERLY, MASSACHUSETTS

HERE IS THE GRINDER YOU ASKED FOR!

● A smaller (14" x 42" or 14" x 48" table) heavy duty, high precision surface grinder with controls at eye level retaining all the features that have made HILL horizontal spindle hydraulic surface grinders famous for precision production during the past twenty years. This is an entirely NEW grinder brought out at your request to compliment the line of HILL heavy duty surface grinders of larger sizes. Where initial cost and limited floor space are critical factors we believe that this new, smaller HILL grinder will solve your finer finishing problems. Full details are given in bulletin 58GS.



HILL Horizontal Spindle grinder with fully hydraulic table and cross feeds. Size: 14" x 42" table with 16" clearance. Magnetic chuck is standard equipment.

Of course we still make the full line of HILL horizontal spindle and vertical spindle grinders in the larger sizes with table lengths from 5 to 20 feet.

THE HILL ACME COMPANY

1207 W. 65th STREET
CLEVELAND 2, OHIO

HILL ACME TOOLS FOR INDUSTRY

Manufacturers of: "HILL" Grinding & Polishing Machines — Hydraulic Surface Grinders — "ACME" Forging — Threading — Tapping Machines — "CANTON" Alligator Shears — Billet Shears — "CLEVELAND" Knives — Shear Blades

. . . wherever abrasive operations are performed

EDITOR'S PAGE

OUR PRICE FOR FREEDOM

There has been a lot of talk lately about our staying out of the little trouble areas of the world. Those who are talking are living in comfort which is enjoyed only by the privileged few outside of the United States. These people are saying, "These little countries are not worth sending our troops to, and besides what difference is it to us if Russia or Red China have a little extra land?" These people seem to have forgotten that we have been telling these little countries that our way of life is the best and that it is worth fighting for. These people are advocating turning our backs on the little countries.

Let's look at the situation logically. There are eight million people in the two communist countries, and our population is one hundred seventy-five million. For this reason alone we need every free thinking country on our side no matter what size. The slow erosion process of the communists will soon leave us standing alone unless we make an effort to stop them. We must draw the line.

There will never be an ideal line of defense. We will never be able to say that later will be better, as the communists will not give us that chance. We must define our position now before the communists do it for us. This does not mean we should start a war, but rather that we are willing to pay the price for our freedom and for what we believe in.

If we look at the situation where we have practiced this policy the results are rewarding. In the Near East we sent troops into a trouble area and they were not challenged. In the China situation the Reds have sent sixteen threats and have yet to take action on any of them. It doesn't seem likely that they are willing to start a war when they are doing so much talking.

What is our price for freedom? Actually our price for freedom will never be cheaper than right now. The price is merely to have the courage of our convictions and the courage to stand up to the communists and say, "Stop." This means we must support our government regardless of the party in power. We must convince the men in government that we have voted them into office because they are the most able to do the clear thinking with all the facts at hand, and that those groups which are bringing pressure on them to back down are actually in the minority. This can be accomplished by talking and writing and by believing within ourselves that we have the courage to stand up for our rights and opinions.

Our biggest failing at this time is the attitude that we should have our freedom free of charge. What have we done in times of peace to pay for freedom? Sure, we pay taxes, but remember the money we pay in taxes is one of the results of freedom. The freedom we enjoy can not be bought in dollars and cents.

Now is the time for us to pay our price. Times have changed due to developments in transportation and communications. We have advanced to the point where what affects one part of the world affects all the world. Let's face these facts and pay our full price for freedom while there is still a market.

W. M. Patterson

MANAGING EDITOR

NOVEMBER, 1958

Crankshaft Grinding at Engine

- ✓ *Increased quality, maximum efficiency, better working conditions, and greater safety are the qualifications for the machines at this newest of Ford engine plants.*
- ✓ *Completely automatic handling of eighty pound crankshafts as from six to eight pounds are removed to obtain the finished part.*

By **M. M. Patterson**
Managing Editor

● The Ford Engine Plant at Lima, Ohio, is one of those, which often are referred to as untouched by human hands type plants. Over 1,000,000 feet of floor space is available for production of Mercury,

...at Ford's Lima ...plant

Edsel, Lincoln and Continental engines. The plant is designed for the production of 4,000 engines daily on a two-shift basis. As the fourth Ford facility to employ the technique of automation in making engines, every spot where automation has been used was subjected to thorough analysis. Through constant study of automation at the previous engine plants (Cleveland Plant No. 1, 1951, renovation of Dearborn Plant, 1953, and Cleveland Plant No. 2, 1955.) and through still more study for this newest plant, Ford engineers have been able to develop an outstanding quality control program. To qualify for installation, equipment had to produce results in terms of increased quality, maximum efficiency, better working conditions and greater safety.

Automatic multiple station checking gages have been integrated into production lines where they keep a constant check on machined parts to determine that all parts meet the rigid standards established by engineering specifications. In addition to these in-line inspection mechanisms, there are approximately 1,700 different gaging applications in use at Lima.

CRANKSHAFT

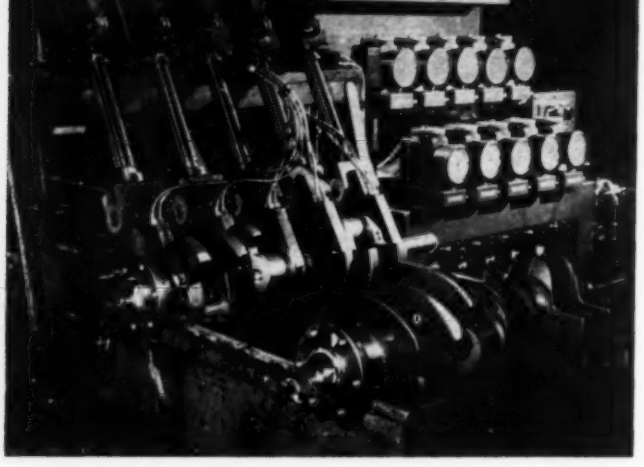
One of the more outstanding developments in the plant is the automated crankshaft area where eighty pound crankshafts move with ease and precision down one of three 588 foot long machining lines which remove from 6 to 8 pounds of material. The crankshaft lines provide an excellent example of what Ford engineers have described as "long, simplified production lines along which intricate parts flow smoothly and evenly—just as fast as modern machine tools can handle them."

The crankshafts shipped to the plant are made of nodular iron which is shell molded to the rough shape. The shell molding has greatly reduced the amount of stock removal in obtaining the finished part. After turning of the pin and main journals the crankshafts move to fully automatic Landis machines for grinding.

The main bearings of the crankshaft are ground simultaneously on a Landis machine using five 42",

Automatic loading and unloading operations are outstanding features of this multiple wheel grinder used for grinding main bearings of a crankshaft. This marks one of the first attempts in the automotive industry to grind the crankshaft on a completely automatic machine.

continued



All crankshafts are post gaged on this machine after the grinding and before the lapping.

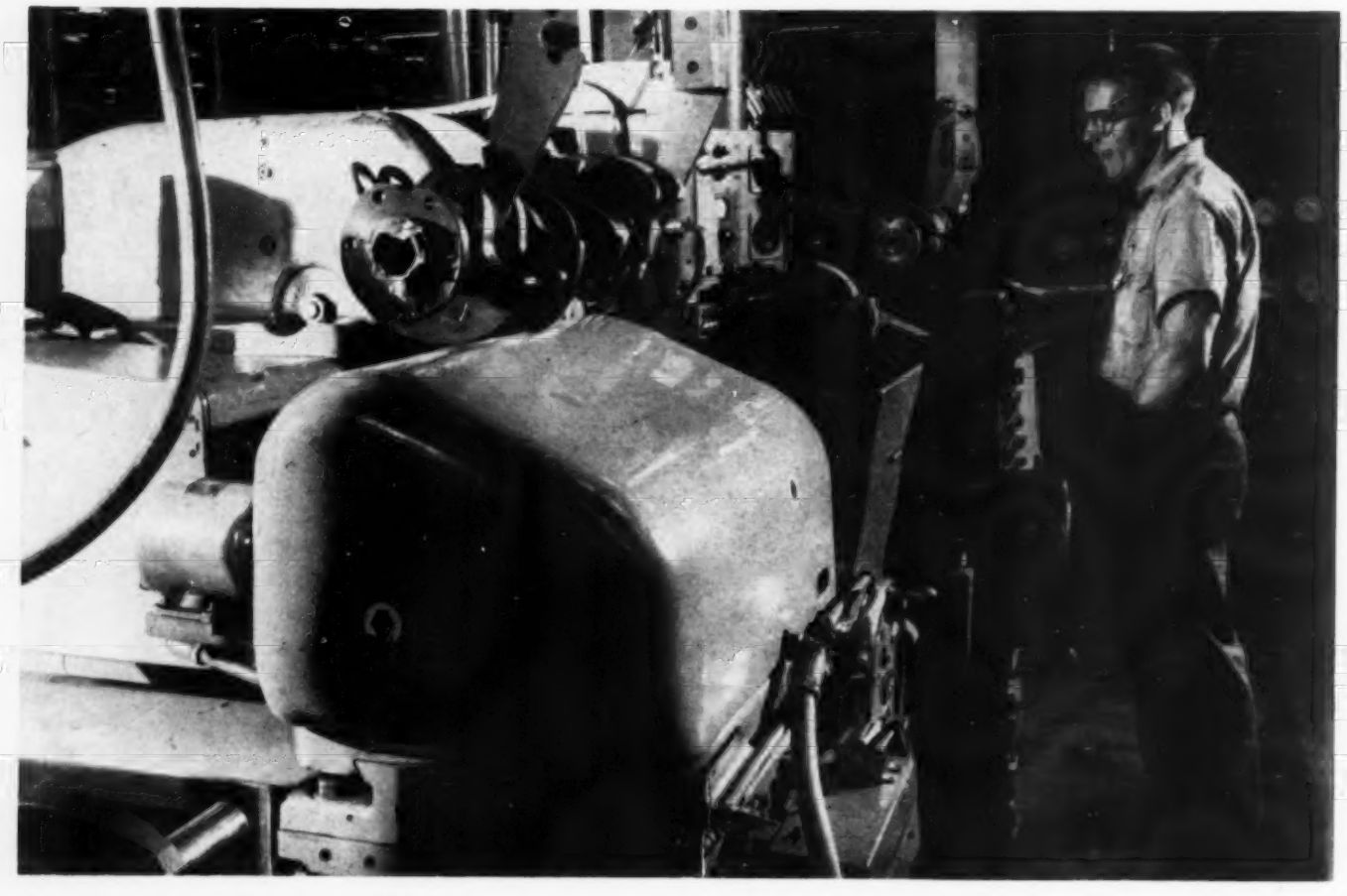
aluminum oxide, 80 grit, N grade wheels. These machines remove approximately .032" of stock with post process gauging to -.0008. Fully automatic, these machines load and unload the crankshaft which is mounted between centers for grinding the mains.

Each line consists of four standard Landis crankpin grinding machines which are synchronized electrically, hydraulically and mechanically.

Crankshafts are brought to the line, at the left hand end, and deposited on a conveyor. The loader picks up a single crankshaft and moves it transversely to the grinding position of the first machine. The shaft is lowered into two chucks. Loader fingers swing out to clear the crankshaft as they return to the upper position. A gauging finger moves into position to accurately and automatically locate the crankshaft longitudinally between the chucks. Hydraulic pressure clamps the crankshaft in both chucks.

The loader, which has a set of fingers at both the right and left hand ends, returns to its original position. One set of fingers is now over the conveyor and one set over the crankshaft.

The grinding wheel, a 42", aluminum oxide, 80 grit, N grade, moves rapidly into position to grind the sidewalls and diameter of the first crankpin of



This automatic transfer-type crankshaft pin grinding machine is capable of machining 40 automobile crankshafts an hour. A crankshaft enters the first machine and automatically is cycled through the three succeeding operations where the four crankshaft pin journals are ground.

the revolving crankshaft. The diameter is ground to a predetermined size within limits of -.0008 removing approximately .045". An in-process double contact air gauge, which is automatically positioned on the pin being ground, controls the grinding cycle through the feed and spark-out periods to final size. After size is reached, the grinding wheel is automatically withdrawn and the crankshaft stops revolving with the chuck clamps in the proper position to open so that the shaft can be lifted vertically.

The withdrawal of the grinding wheel signals the loaders to again handle the crankshafts. The shaft from the first machine is moved to a conveyor between the first and second grinders. Here, it is automatically inspected for proper diameter, width and taper.

If any of the dimensions do not pass inspection, signal lights show which dimension is in variation from the limits. The preceding grinding machine will stop cycling until the correction is made. A set of visual gauges show the inspection sizes so that the operator knows how much correction to apply.

The pickup, grind, pickup, inspect cycle continues through the four machines until the crankshaft is finished. All grinders and loaders are in continuous cycle so that four crankshafts are being handled at all times.

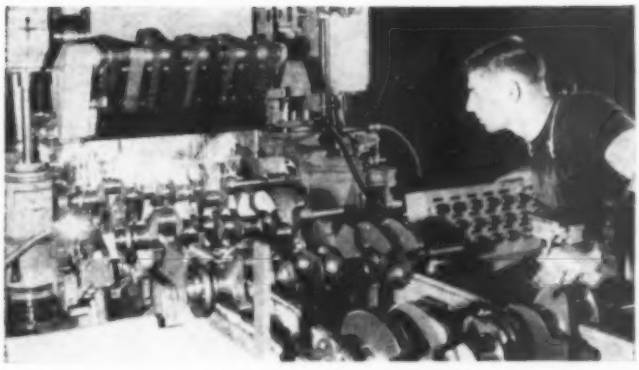
The conveyors, between the grinders, have provision to store a quantity of crankshafts. However, a particular machine loader will not operate unless there is a crankshaft ready for loading and a vacant space on the next conveyor to deposit a finished shaft.

In the event that it is necessary to shutdown one machine for changing wheels or regular maintenance, the other three machines will stay in operation. The crankshafts are by-passed around the machine that is shutdown. The operation missed on the shutdown machine can be done on a conventional hand-operated, stand-by machine.

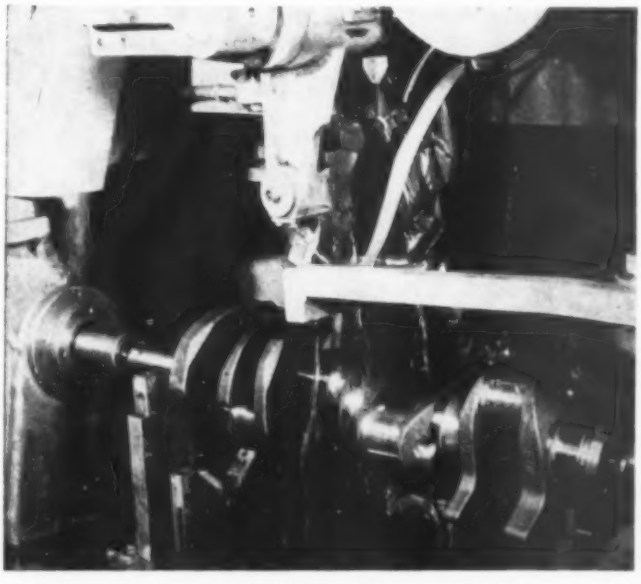
Complete safety devices are built into the machine system to prevent any damage. Grinding wheels cannot move while loaders are in operation. Crankshaft carrving fixtures cannot revolve until a shaft is in position, clamped and the loader arms are retracted.

LAPPING CRANKSHAFTS

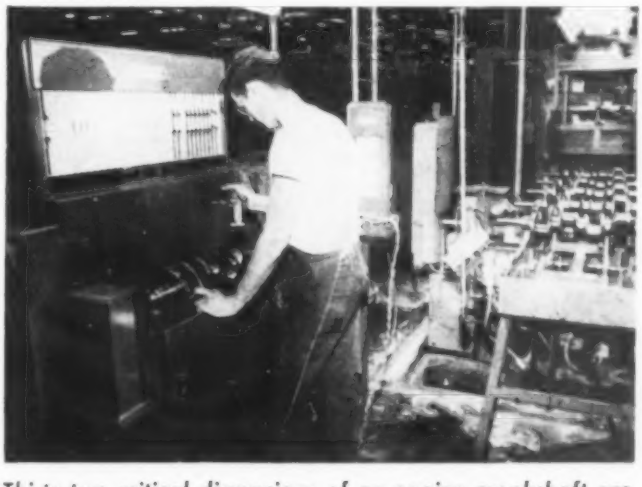
Following the grinding and balancing, the crankshafts are conveyed to an Impco lapping machine. This machine through the use of 220 grit cloth belts laps the main and pin journals. The thrust faces on the number three main bearings separate from the mains and the pins. This machine also knurls the number 5 main O.D. The finish is held below 12RMS while stock removal is held to .0003" to .0004" which eliminates any surface defects. Mineral seal oil is used for coolant. The steel shoes place the pressure on the belts which are indexed after each shaft automatically. • • •



This automatic machine gives automobile crankshafts the highly-finished surfaces necessary for perfect operation in your automobile engine. This constitutes the final machining operation on crankshafts produced.



This operation is the finishing of the thrust faces on the number three main bearing journal.



Thirty-two critical dimensions of an engine crankshaft are gaged simultaneously and automatically on this air-operated visual gage. Although the crankshafts are checked at practically every machining operation, they receive a final dimensional check while being rotated on this gage. Crankshaft diameters must fall into an acceptable range limit or the crankshaft is rejected.

A Guide to Rough Grinding Carbide Tools

Rough grinding carbide tools is actually a precision grinding operation to precise angles, blueprint dimensions and sometimes to match precision templates.

This article answers the nine most frequently asked questions and presents a guide page for easy reference.

By **Richard A. Parke**
Grinding Engineer
Norton Company
Worcester, Massachusetts

● Practically all carbide tools are ground in two steps. The first is known as rough grinding and is usually done with a silicon carbide grinding wheel. The final step is done with a diamond wheel.

The term "rough grinding" is actually a misnomer. It is a precision grinding job in every sense of the word. The grinding is done to precise angles, to blueprint dimensions and often to match precision templates.

Because there is not much difference in hardness between the carbide and the silicon carbide wheels which grind them, the selection of the correct wheel for regrinding is of great economic importance.

FLOOD COOLANT should be used for all rough grinding of carbide tools.

If we could sum up the answer to carbide grinding problems in one phrase it might be "Use soft wheels and light pressure." Of course the answer isn't that simple but the use of soft wheels and light pressure will appear frequently in the answers to problems discussed in the following pages.

Question: Grinding carbide tools first on an aluminum oxide wheel to relieve the steel shank and then on a silicon carbide wheel to rough grind the carbide requires two wheels, two operations, and requires extra handling of the work.

Answer: One silicon carbide wheel will relieve the steel shank and grind the carbide. Test grind the steel on soft silicon carbide wheels until one is found which will break down readily enough to grind the steel without loading the wheel. Then use this same wheel to grind the carbide. Use light pressure in grinding the carbide to eliminate excessive wheel wear. The wheel selected for this dual operation will probably be softer than the wheel normally used for grinding the carbide alone.

Question: What wheel specification to use for the various grades of carbide.

Answer: Carbides range in hardness from about 88 to 94 on a Rockwell A Scale. The softer grades are used for such applications as mining bits because they have greater impact resistance. Intermediate grades, 90 to 91 in hardness, are used for conventional tooling in metalworking plants. These

grades represent a suitable compromise between high wear resistance and high impact strength. The hardest grades of carbide, 92 and 93, are used where great wear resistance is required.

As the hardness of the carbide increases, the hardness of the silicon carbide wheel used to grind it must decrease. Carbide is not especially heat resistant. Therefore, light grinding pressures and soft wheels are needed to prevent burning the carbide.

Medium hard grades of carbide are usually ground with a 60 grit wheel. The hard grades of carbide should be ground with finer grit wheels, about a 90 grit. The finer grits are necessary to prevent chipping, flaking or saw-tooth edges in the hard grades. These faults are more common in the hard grades because of the lower impact strength.

Question: Silicon carbide wheels which have been tested and proved satisfactory, suddenly do not work properly.

Answer: This usually happens when the operator is changed on the tool grinding operation. The grinding pressure applied by the operator is very critical in rough grinding of carbide tools. If an operator using relatively heavy pressure is replaced with an operator employing light pressure, the same wheel will act too hard. If the wheel was originally selected for an operator using light pressure, a heavy pressure operator will experience excessive wheel wear.

If different operators are to use the same wheel, select the wheel which is correct for the one using the least pressure. Then educate the others to use lighter pressure. They will find light grinding less tiring at the end of the day. This problem is particularly acute when both men and women are employed in the rough grinding operation.

There have been some recent developments in fixed feed grinders to control the problem of grinding pressure. The Oliver Template Grinder is such a machine. In this machine, the tool is held in a workholder which is supported by a yoke. By leverage pressure, the operator grinds the tool to conform to a template. His weight, or pressure, forces the template, which is mounted on the leverage arm, against a rubbing plate which is mounted on the machine. While the weight or strength of the operators causes some pressure variation, the machine minimizes the effect.

Question: Is there one wheel specification which will grind all the tools in the shop?

Answer: In most toolrooms, there are a great variety of sizes of tools to be ground. A wheel which was originally bought for use on planer tools, is often found grinding lathe or screw machine tools, which have smaller areas of contact. It is possible to use one wheel for such a variety of tools (of the same general carbide hardness range).

To select such a wheel, begin with the largest tools to be ground. Determine, by trial, the silicon carbide wheel which is soft enough to grind the tool with the largest area of contact. All smaller tools can then be ground on this wheel and operators should use less pressure on the smaller tools. Too much pressure will cause excessive wheel wear, and may burn the work.

Question: Will crowning the rim of the wheel improve carbide grinding?

Answer: Crowning the rim of the wheel is recommended for rough grinding of carbides because the smaller area of contact between the wheel and the work gives a faster cutting action. It permits the use of a harder grade wheel which usually is more economical. Crowning reduces the variation on grinding pressure required between large and small tools of the same carbide grade because the area of contact is more nearly the same for all size tools. Grinding on a crowned wheel requires a higher degree of skill on the part of the operator however.

The crowning is done with a conventional wheel dresser. A radius of about 4" is customary. A vernier guide will aid the operator in grinding a straight edge although most experienced men will do this operation off-hand without difficulty.

Question: Should I use coolant in rough grinding of carbide tools?

Answer: Flood coolant is recommended for all rough grinding of carbide tools. The only exception is in

OLIVER TEMPLATE GRINDING MACHINE features fixed feed to control the problem of grinding pressure. The operator, through leverage pressure, grinds the yoke-supported tool to conform to a template.

the case of very small tools, such as boring bits, where coolant may be dispensed with if the operation does not generate enough heat to harm the carbide.

Carbide is quite sensitive to heat and has low resistance to thermal shock. It is important to keep the tool cool during grinding. Dipping a hot tool in water occasionally, as is often done with high speed tools, can be disastrous with carbides.

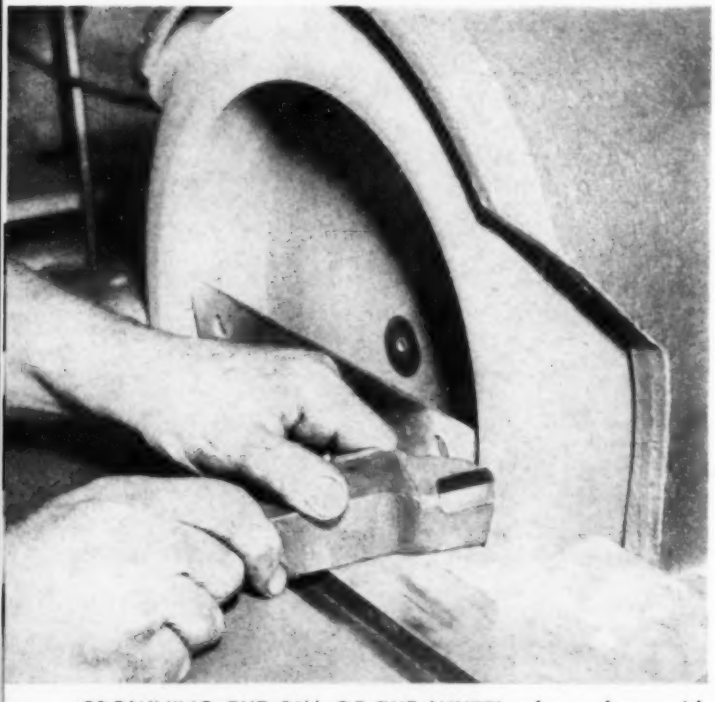
If a rough grinding operation has been done dry, flood coolant will usually permit the use of a wheel one grade harder since a softer wheel has been in use to prevent overheating.

The coolant used is generally plain water with a rust inhibitor added.

Question: When should porous, or semi-porous wheels be used?

Answer: Silicon carbide wheels for rough grinding of carbides are made in three structures . . . porous, semi-porous and dense. Porous type wheels are used for grinding the really large area of contact tools where chip clearance is needed. Chip clearance is required in operations where the steel shank is ground simultaneously. Chip clearance is not required for the carbide itself. The semi-porous wheels are recommended for smaller tools in which a much smaller steel area is presented to the wheel. In the smallest tools, in which only carbide is ground, the dense type of wheel is recommended. These recommendations are made in the interest of economy.

In grinding, it takes abrasive to remove stock. The more dense the wheel, the more abrasive and hence the faster stock removal. Carbide is a product of powder metallurgy and in the grinding operation, a chip is not made as in conventional metal grinding. The abrasive pulverizes the carbide. Except for the chip clearance requirements of grinding the steel shank, the densest possible wheel should be used.



CROWNING THE RIM OF THE WHEEL, shown here with coolant turned off, is recommended to obtain faster cutting action by means of the smaller area of contact offered. Crowning also reduces variations in grinding pressure required on large and small tools of the same carbide grade. The crowning is done with a conventional wheel dresser to obtain a surface with a 4" radius.

Question: Should I use premium priced green silicon carbide wheels or the lower priced gray silicon carbide wheels?

Answer: The improvement in performance will justify the slight additional cost of the premium priced green silicon carbide wheels. The green grit is cooler cutting, breaks down and produces more sharp cutting points readily, and is more friable.

The gray silicon carbide is the "work horse" of this family of abrasives. It's used for snagging cast iron and it works well in the stone industry where the wheels are subjected to rough treatment because of the nature of the work. In carbide grinding, however, we have a precision form of grinding where light pressures are involved. For this reason, the green silicon carbide is recommended.

Question: Although I've had no trouble regrinding carbide tools, suddenly I'm experiencing cracking in the brazed carbide tips of new tools during the initial rough grinding.

Answer: Before you blame the wheel, check your brazing methods. Sandwich brazing has been used very successfully to eliminate the problem of stresses caused by high unit pressure grinding. In sandwich brazing, the compound sandwiches a piece of metal, usually copper, about the thickness of shim stock. In the brazing operation, this uniform layer bonds the carbide insert to the steel shank with a minimum of stress.

Summary

From an economy standpoint, a single silicon carbide wheel which will do rough grinding on every tool in the shop would be very desirable. To reach, or approach, this ideal condition, these are the steps to try:

1. Select a wheel which will just break down readily on the largest tool to be ground.
2. Select a wheel which will break down readily when used by the operator employing the lightest grinding pressure.
3. Select a wheel which will break down readily when grinding the relief on steel shanks.
4. Select a wheel with fine enough grit to prevent chipping, flaking or saw-tooth edges on the hardest carbides to be ground.
5. After selecting a wheel which meets the foregoing requirements, prevent overheating the carbide and excessive wheel wear by use of flood coolant and by reducing grinding pressure to the minimum possible without loading the wheel.
6. Crowning the wheel, thereby reducing the area of contact with the wheel, will often reduce the range of variables to consider in selecting the one wheel for grinding all carbide tools in the toolroom.

• • •

SOLUTIONS TO ROUGH GRINDING TOOLS

For Rough Grinding of Carbide Tools With Silicon Carbide Wheels

PROBLEM	SOLUTION
1. Extra work involved in relieving the steel shank on an aluminum oxide wheel and then grinding the carbide with silicon carbide wheel.	1. Select a silicon carbide wheel which will grind the steel, breaking down readily enough to prevent wheel loading and use the same wheel to grind the carbide using light pressure.
2. Selection of silicon carbide wheel for various grades of carbide tools.	2. For soft carbides, R_a 88-89 use 54 grit silicon carbide, soft enough to break down readily. For medium grades of carbide, R_a 90-91, use 60 grit silicon carbide, soft enough to break down readily. For hard grades of carbide, R_a 92-93, use 90 grit silicon carbide to prevent chipping, flaking and saw-tooth edge.
3. Silicon carbide wheels which have been tested and proven satisfactory, suddenly do not give the same results.	3. A change in operator will often cause this trouble. Grinding pressure exerted by the operator is very critical in wheel selection. Choose the wheel suited to the operator using the least pressure and educate other operators to use less pressure to reduce excessive wheel wear.
4. The same silicon carbide wheels act differently with various types of wheels.	4. Select proper grade silicon carbide wheels for the largest tool to be ground, such as planer tools. Same wheel will grind smaller tools with less pressure required.
5. What effect does crowning the wheel have?	5. Crowning the flat rim of a silicon carbide wheel produces faster grinding action by reducing the area of contact between the wheel and the work. This allows use of harder wheels and makes more practical the use of one wheel for all tools. Greater operator skill is required, however, in using crowned rim wheels.
6. Excessive heat in grinding carbides.	6. Always use flood coolant on all tool grinding. Use light grinding pressure and be sure wheel is soft enough to break down readily. Coolant may or may not be used on small tools.
7. When should porous, semi-porous and dense wheels be used?	7. For grinding large tools and steel shanks simultaneously, use porous type wheels. For grinding medium tools and steel shanks simultaneously, use semi-porous wheels. When grinding small tools, or when grinding carbide only, use dense wheels.
8. When should green silicon carbide wheels be used?	8. Green silicon carbide wheels are recommended for all carbide tool grinding. Although higher in cost than gray silicon carbide wheels, they will prove more economical because of improved performance.
9. Suddenly new tools being ground for the first time begin cracking during the initial grinding although there is no trouble in regrinding other tools.	9. Check your brazing operation. Sandwich brazing will often eliminate the stresses set up by high unit pressure grinding. The cracking may be caused by the latter.

Better Diamond Dressing for Precision Grinding

- ✓ *Keep diamond dressers sharp*
- ✓ *Use rapid dress lead—.001" to .0015" per revolution*
- ✓ *Maintain wheel pressure on work just under point of rapid wheel breakdown*

By **H. B. Patterson**
Research Engineer
Bryant Chucking Grinder Co.

● Good wheel dressing procedure is a subject on which there is considerable difference of opinion among grinding wheel users. It is generally agreed by precision grinding experts that dressing a wheel to produce good finish brings with it some sacrifice in stock removal, and, conversely, that dressing for maximum stock removal results in some sacrifice of finish. Beyond this one point on which there is agreement, there are few non-controversial facts on wheel dressing.

In an attempt to obtain more definite answers to some of the problems in wheel dressing for precision grinding, the Bryant Chucking Grinder Co. instituted a program to study the problems of dressing. A Bryant "Centalign" was tooled up so that stock removal rates could be easily measured and tabulated. All variables known to have any effect on stock removal rate, such as wheel specification, coolant, diameter ratios, etc., were held constant so that the effect of various dressing procedures could be accurately measured. The grinding wheel was applied to the work piece with a constant normal force by means of dead weights and the movement of the wheelslide due to stock removal recorded. This was done with equipment as shown in Figure 1. The information presented here cannot be applied to other grinding situations but the principles illustrated do apply to all grinding. All the tests mentioned were made with aluminum oxide 80 grit wheels, M grade, 6 structure, vitrified bond. The work material was 52100, Rockwell C-60.

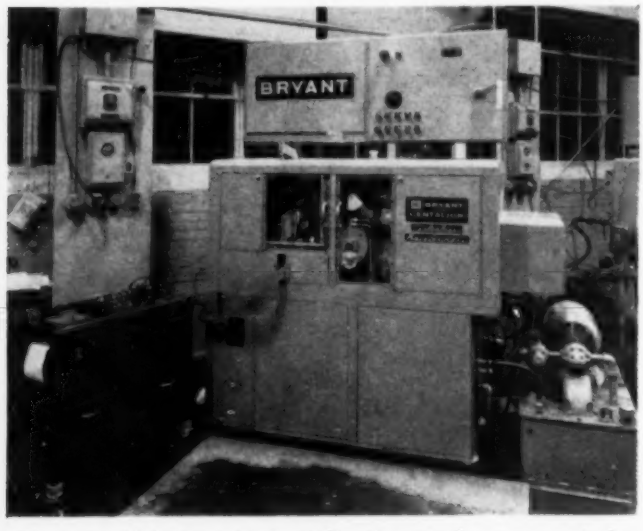


Figure 1—This Bryant "Centalign" centerless race grinder was tooled up for the tests so that stock removal rates could be readily measured.

Comparison of Dull and Sharp Diamonds

Figure 2 is a comparison of a dull diamond to a sharp diamond, the latter being the same one as was used in the test shown in Figure 3. The dull diamond had a flat measuring almost 1/32 across the point. Both diamonds were examined by microscope and optical comparator to determine their geometry before use. This test indicates that a dull diamond can never dress the wheel in such a manner as to give maximum stock removal. It must be remembered that a diamond is not as permanent as we would like to believe, but is actually wearing with each dress

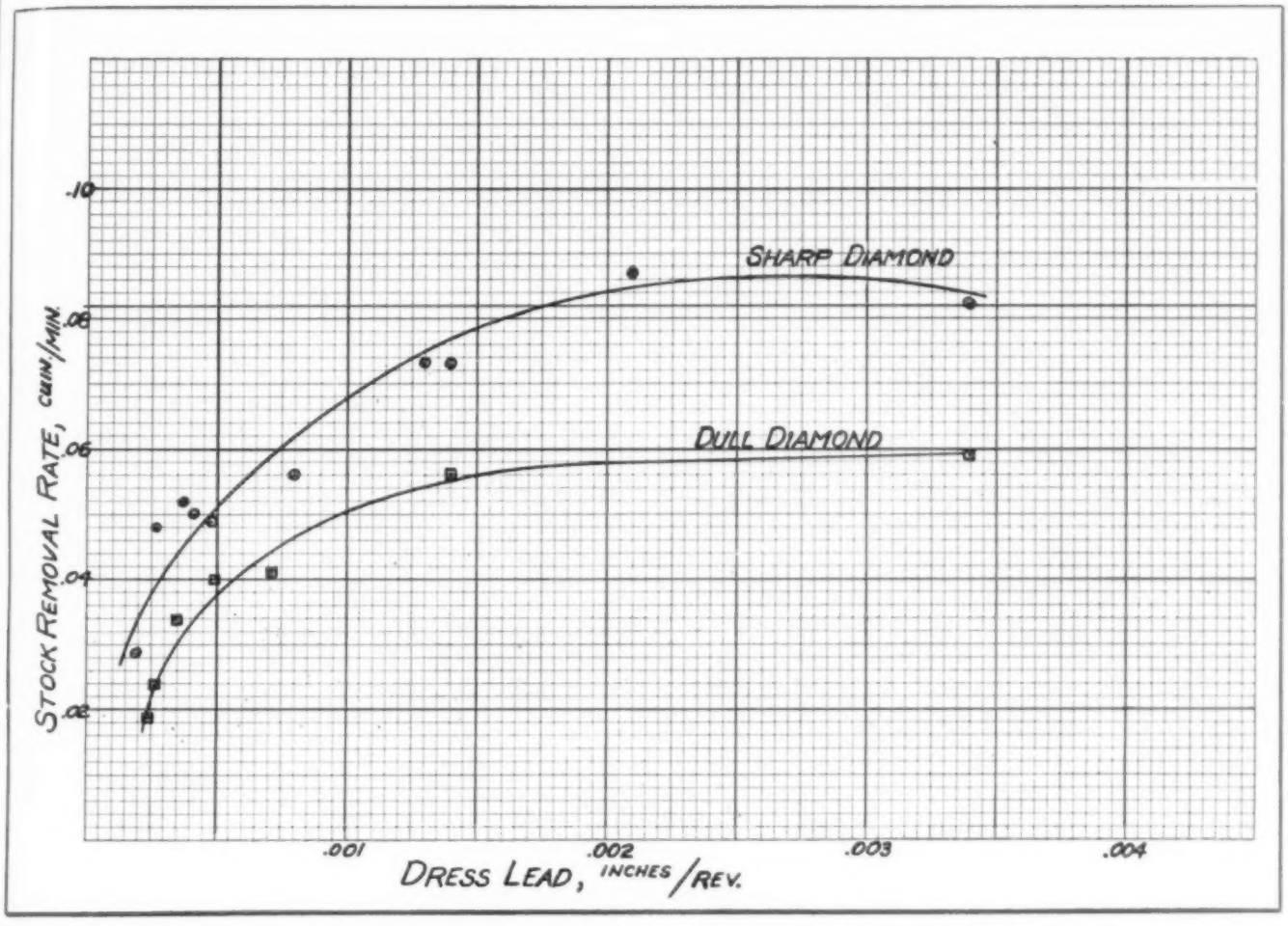


Figure 2—The wheel dressed with a sharp diamond has a consistently higher rate of stock removal than one dressed with a dull diamond, regardless of increase in dress lead. The wheels were applied to the work with a constant force (Fn) of 19 pounds.

and is, therefore, in a state of transition from sharp to dull.

In another test, to determine how extreme the effect of diamond wear could be, a flat was purposely ground on a diamond dressing tool. The wheel dressed with this flat diamond showed only 19% of the cutting ability of a wheel dressed with a sharp diamond.

Effect of Dress Lead

Figure 3 shows the effect of dress lead on stock removal ability of the wheel, dress lead being the pitch of the helix inscribed by the diamond on the wheel during the dressing operation. The diamond used for this test was a conventional single point stone having a slightly worn point, less than .002 across. In ordinary precision grinding, this would be considered a sharp diamond. It is obvious that stock removal rates increase rapidly with a more rapid dress, up to about .0015" per revolution. Too slow a dress results in cutting ability of less than one-fourth of that obtainable with a fast dress. The general tendency of grinding machine operators is to use dress leads that are too slow to achieve maximum stock removal rates.

One of the most interesting results from these experiments concerns the life of the wheel after dress. Apparently, after a wheel is dressed it has a certain cutting ability which remains constant for long periods of time. If cutting ability is low after dress it will stay low, and no wheel wear process tends to sharpen the wheel. In like manner a wheel dressed for maximum stock removal rate does not dull measurably even after removing ten times the stock it would normally be required to remove. This ability to maintain stock removal rate is evident on all test runs regardless of the dressing method used. Abrasive type and bond other than those used may give a different picture of wheel life if they act to alter the wheel wear process. Machine rigidity and vibration characteristics have a considerable influence on wheel wear and therefore on the ability of the wheel to maintain its initial sharpness. Control of vibration is important in any attempt to use a grinding wheel at its maximum performance level.

Effect of Normal Force on Stock Removal, Surface Finish

Figure 4 shows how stock removal rate and surface finish vary throughout the range of normal forces used in these experiments.

Stock removal rate increases in direct proportion to increasing normal force up to the point where rapid wheel breakdown occurs. Most vitrified bond

wheels in common usage on precision grinding equipment will be limited by this point of rapid breakdown. However, it is believed at this point that a great many machines on production work do not use the wheel as well as they should, due to harmful vibrations. In other words, the wheel begins to break down due to peak loads caused by vibration rather than from steady pressure of the wheel against the work.

Surface finish rapidly gets worse when normal force increases, as plotted in Figure 4.

Variables in Single-Point Diamond Dressing

In single-point diamond dressing there are three important variables that must be considered if maximum stock removal rates are to be attained. They are:

1. Diamond point shape
2. Dress lead
3. Amount dressed off the wheel

The right combination of these factors results in the most favorable cutting ability. At the present time there are no hard and fast rules that can be stated. Additional research may eventually result in enough information to guide those concerned with the problem of obtaining maximum stock removal rates. It is a certainty that some very significant gains in productivity could be achieved through more general use of such information.

It is easily possible to lose four-fifths of wheel's cutting ability due to improper dress procedure. A simple experiment was performed to illustrate how extreme this loss of cutting ability can be. Keeping all conditions the same as on the preceding experiments, a wheel was purposely dulled. The grits were dulled, but not loaded with work metal. Though this wheel was held against the work at 19 lbs. normal force for 36 seconds, no measurable stock removal took place. Such an extreme condition would rarely be encountered in practice, but loss of half the cutting ability of the wheel is probably very common. So common, in fact, that many plants may operate grinders in this manner regularly without ever realizing it is possible to alter the situation.

Attaining maximum stock removal rates is a complex and difficult task and maintaining such rates on production machines is even more difficult. The grinding machine must be capable of using the grinding wheel efficiently. The grinding wheel must be carefully chosen to operate properly with the work material and coolant. The dress procedure must be adjusted to give highest cutting ability. Of these factors, the dress procedure is probably the least understood and therefore the area where the largest gains can be made quickly by applying some of the principles that have been briefly mentioned here. • • •

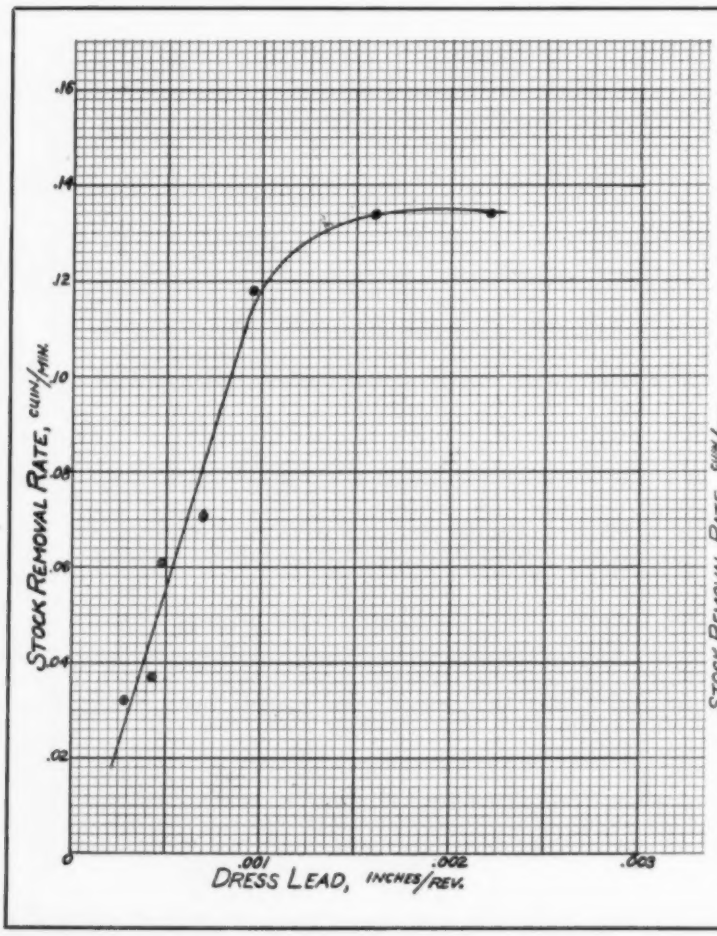


Figure 3—Stock removal rate increases rapidly as dress lead increases, up to about .0015" dress lead per revolution.

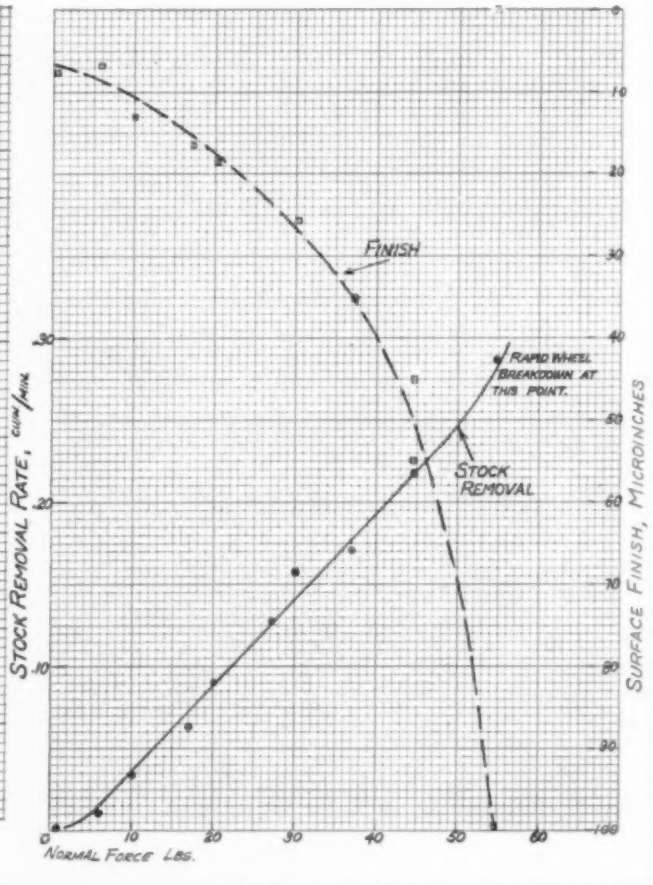
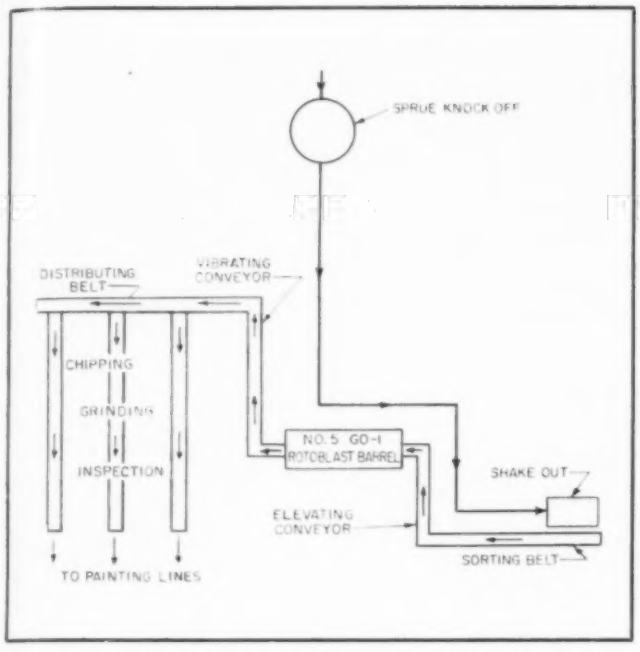
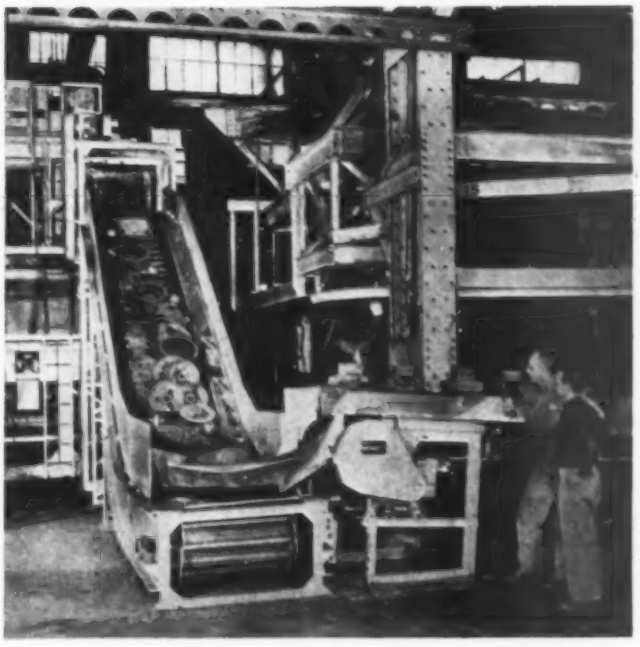


Figure 4—Confirming general opinion, increased normal force results in higher stock removal rate, poorer finish.



Plan view of the International Harvester Milwaukee Works blasting line.



Entrance of the 72 inch diameter Rotoblast barrel. Foundry parts are removed through a sprue knock-off station from a monorail cooling conveyor, deposited into a shakeout, and transferred to the sorting belt (right) which feeds the slat elevating conveyor.

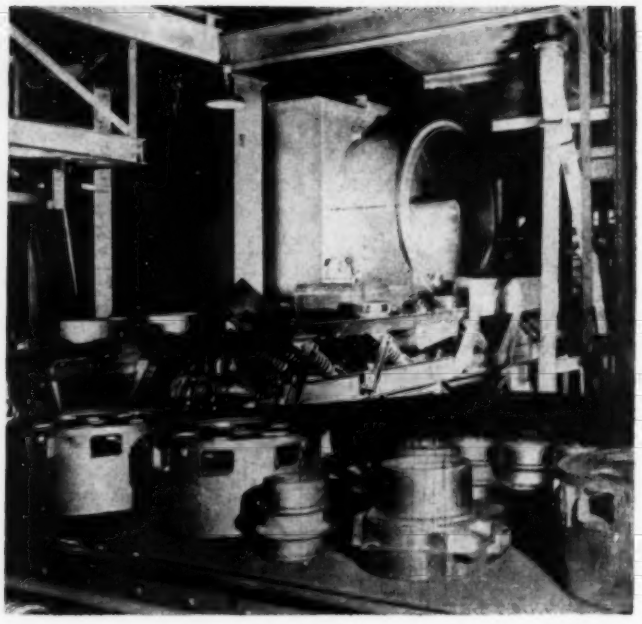
Continuous Blasting Boosts Production, Cuts Handling

- √ *Replaces seven tumbling mills, two large batch barrels*
- √ *Reduces labor requirements by a third*
- √ *Cleans up to 16 tons of castings per hour*

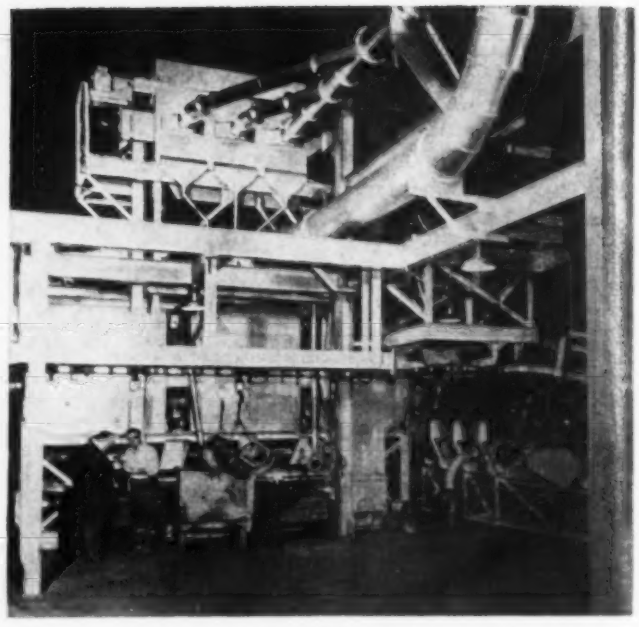
● In plants with large volume of production, continuous blast cleaning is reducing cleaning costs by eliminating costly handling time and reducing labor requirements. Unlike batch units, a continuous barrel handles a steady flow of work coming from the preceding operation which may be castings from the shakeout, forgings from the heat treat or stampings from the presses. As work flows through the barrel at a steady rate, each piece is blasted, the abrasive removed and the work ejected in a constant stream for conveyance to the next operation.

To meet increasing production requirements, Milwaukee Works of International Harvester Company's Construction Equipment Division, Milwaukee, Wisc., installed a continuous cleaning barrel to lower cleaning costs and cope with faster production schedules. A 72 inch diameter Rotoblast barrel, that replaces seven tumbling mills and two large batch barrels, has reduced labor requirements by one-third, cut floor space requirements and reduced maintenance expenses.

The normal foundry production of this plant is over 400 tons per day of gray iron castings. Castings produced in the foundry are used by other Divisions of International Harvester and other companies. The majority of castings are sent to the



Cleaned castings are transferred to the distributing belt for sorting, then routed to chipping, grinding and inspection stations, and on to the paint lines.



To insure a constant flow of clean abrasive, the Continuous-Flo barrel is equipped with a special type BZ separator which collects all abrasive, removes the refuse and fines, and returns the good abrasive to storage bins for re-use.

Melrose Park Works and Tractor Works in Illinois where International Harvester manufactures their crawler tractors.

The recently installed "Continuous Flo" barrel, made by the Pangborn Corporation, Hagerstown, Md., is currently cleaning about 10 tons of castings per hour. As production warrants, the barrel is designed to clean up to 16 tons per hour, depending upon the size and shape of the castings.

Used for large and small parts alike, the 72 inch diameter barrel will handle castings up to 28 inches long. Foundry parts cleaned include 200 pound, 27 inch diesel heads, 140 pound steering drum castings, small track idlers, medium size gear housings, sprockets, engine front covers, gear housing covers, clutch housings and transmission housings.

Integrated as a part of the foundry millroom operation, most costly manual handling has been eliminated. From a monorail cooling conveyor, castings are moved through a sprue knock-off station, deposited onto a shakeout, and transferred onto a sorting belt which feeds onto elevating conveyor and into the continuous Rotoblast barrel.

Castings are conveyed into the barrel in a continuous stream. Inside the barrel are two rotating steel drums supported and driven by two parallel shafts. In the space between drums are metal slat conveyors which transfer the work from drum to drum. In spaces above the slat conveyors and between the drums, two Rotoblast wheels are located so that the length of blast pattern is parallel with the length of the drums. Lifting cleats on the inter-drum face tumble the work through the blast pattern to each wheel, assuring complete cleaning of all pieces and load.

Two 19½ inch diameter by 5 inch wide Rotoblast wheels, each powered by a 40 hp motor, throw approximately 100,000 pounds of steel shot abrasive per hour. Both wheels are exposed within the barrel, eliminating the breakdown of abrasive against wear plates and end plates as in batch type barrels. The upper wheel housing is enclosed with a heavy rigid plate equipped with a quick replacement wear-liner to protect equipment and confine stray shot.

The end drum of the barrel is spirally sealed from the blast action. Within this drum the load is tumbled thoroughly, so all the abrasive is removed and returned to the reclamation system for re-use. At the discharge end, the cleaned work, free from abrasive, flows down a chute onto a vibrating conveyor. A distributing belt is used for sorting and the castings are routed to chipping, grinding and inspection stations and on to the paint lines.

Since the machine is planned for continuous operation, particular attention has been paid to the accessibility of wearing parts. New abrasive can be added while the machine is operating. The usual machine "down-time" for loading, unloading, replacements, repairs, etc., has been eliminated or minimized resulting in tremendous tonnage of cleaned work per hour at extremely low cost. • • •

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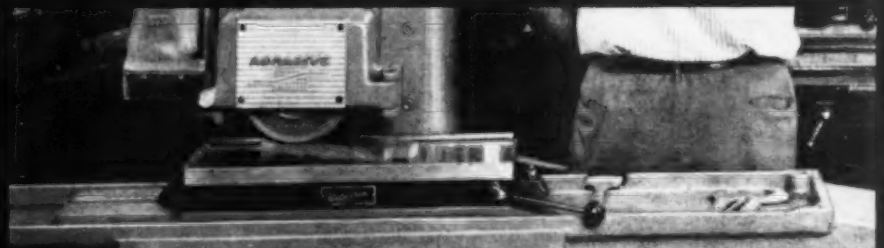
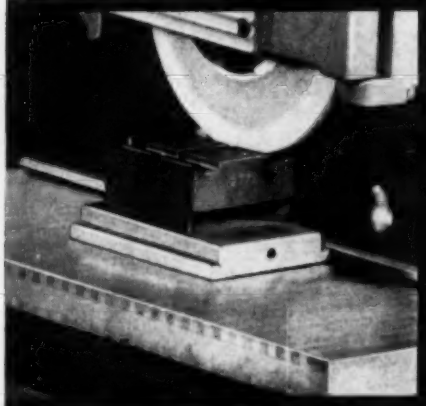
"Our new 618's", reports Bob Pringle, General Manager of Winslow Manufacturing, Cleveland, "are what we've needed to help us stay on top as the **first name in precision control.**" With Abrasive's modern design and 'operator engineered' features, the story is the same in precision shops all over the country.

At Winslow, "the feature which most impressed our employees is the fast table travel. This makes it much easier to grind hardened material." And well it should! The 618 rides smoothly on precision anti-friction rollers. It is actuated by a smooth cable and drum drive. You get 6" of table movement with each turn of the 8" handwheel .





Bob Pringle goes on to report, "we have used the machine primarily for gage work and find that the finish is very good. It's excellent for side grinding, too." Heavy, rugged, deeply-ribbed construction plus the advantages in Abrasive's motorized spindle and wheelhead assembly make high finishes easy.

Precision and efficiency are vital at Winslow, and they found "the good repeatability of the 618 dial settings to be of special advantage." All operators appreciate the comfortable, balanced feel of the smooth recessed handwheels, available either right or left-handed. They like the comfort and convenience of the controls all located on the same waist-high plane.

It makes good sense for you, too, to look into the many profit-producing advantages of the new Abrasive 618's. Without obligation our colorful eight-page tell-all brochure is yours. **Write for it, today!**

ABRASIVE MACHINE TOOL COMPANY

Dexter Road
East Providence 14, Rhode Island

grinding SAFELY

For Safety's Sake...

ALWAYS RING TWICE

By **Richard L. McKee**
Associate Editor

• The postman, according to the title of a novel popular a few years back, always rings twice.

So does a grinding operator, just before he mounts a new or used grinding wheel on a machine, especially if the wheel has been out of service for a considerable time. Such a test should also be standard procedure when grinding wheels are received, in addition to normal visual inspection to detect damage from handling, shipping or other causes. A sound wheel gives a clear metallic ring when tapped with a wooden mallet or a similar wooden handle; a cracked wheel sounds dead.

The test is simple, but it does require a few precautions to make sure that the results are accurate. All the equipment needed is something like a wooden mallet for large wheels, and a wooden tapper—a piece of a broomstick will do—for small wheels.

Wheels must be dry and free of sawdust. If the wheel is too large to be suspended on a finger or a pin, then the floor on which it rests should be clean and hard.

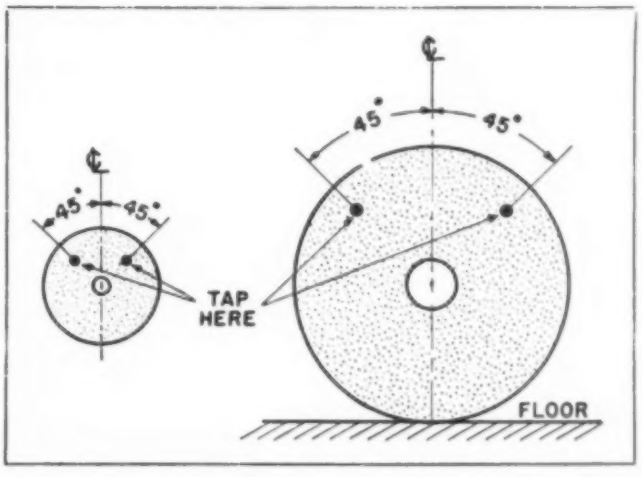
Where it is convenient to do so, a large wheel may also be suspended from a cable sling on a hoist, as illustrated. Suspending the wheel possibly results in a more accurate test.

Tap the wheel about 45° on either side of the vertical center line, and about one or two inches in from the periphery, as illustrated. Then rotate the wheel about 45° and repeat the test. A sound wheel, especially a large one supported on a floor, may emit a muffled ring when struck directly on the vertical center line.

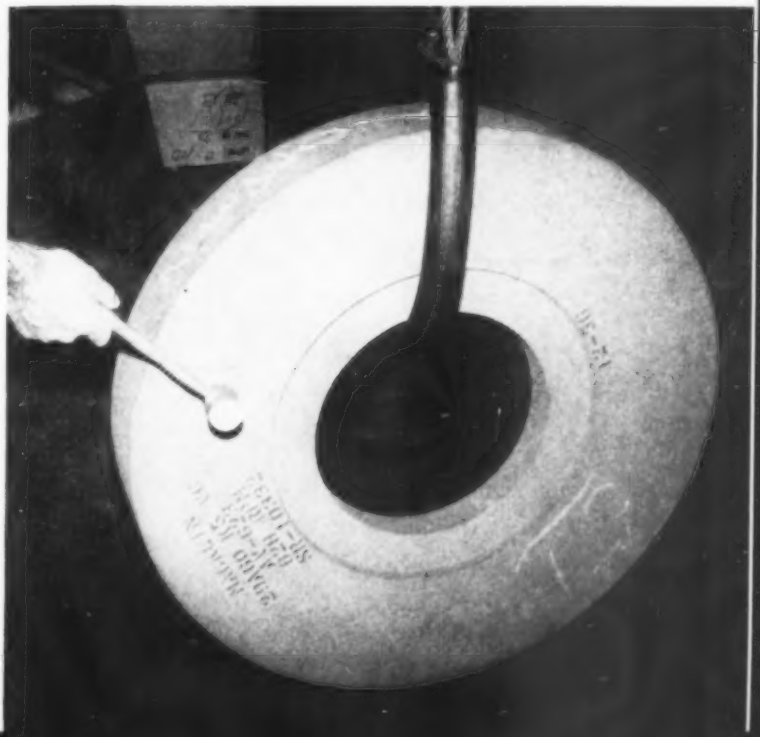
A vitrified or silicate wheel gives a clearer ring than an organic bonded wheel.

Any wheel which sounds significantly different from other wheels of the same lot and specification should be set aside for further testing before it is put into use.

• • •



Sketch illustrating the recommended spots to be tapped in the ring test—approximately 45° on either side of the vertical center line and one to two inches in from the periphery.



Operator tapping a large wheel in a ring test, before placing it in storage. The test should be repeated before the wheel is mounted on a machine, especially if it has been in storage for some time. (Photo courtesy International Harvester Company.)

How Howard McGlory cu
with a hard-sided

Howard F. McGlory is Bay State's special sales engineer for the Pittsburgh and Detroit areas. His job is to add his knowledge and experience to that of the many Bay State Abrasive engineers in these areas. Because of his wide and varied experience in diamond grinding wheel application problems, he has spoken, with authority, to many groups on carbide grinding.

grinding costs at Kennametal
diamond grinding wheel...

As one of the nation's top producers of cemented carbide products, Kennametal, Inc., uses a lot of diamond grinding wheels; and considering the expense of diamonds, they cannot be casual about their grinding costs.

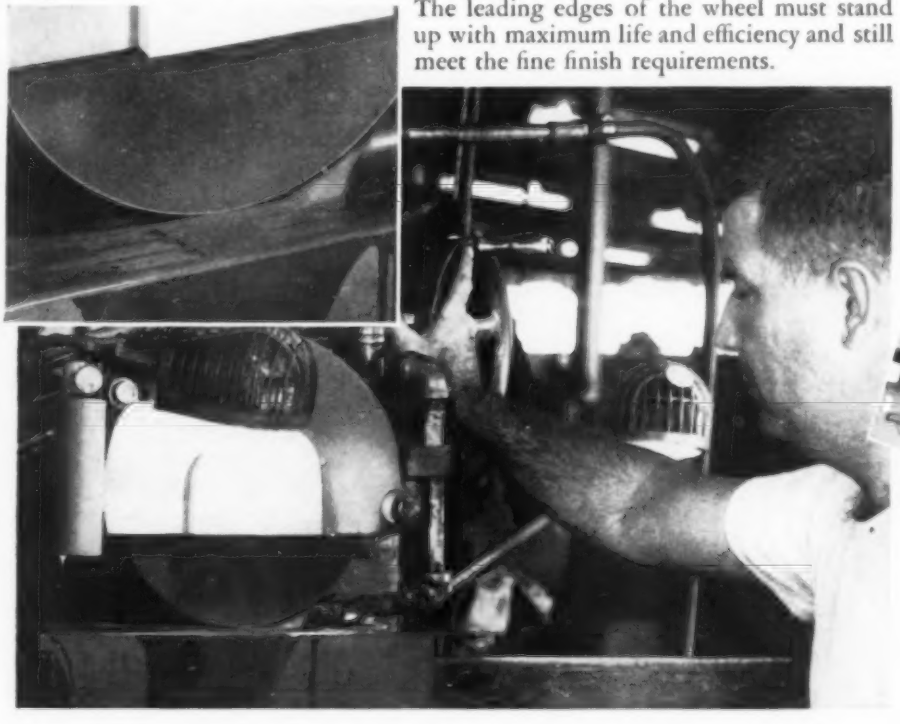
That's just where Bay State's new hard-sided diamond wheel does an outstanding job.

As Bay State's Howard McGlory puts it: "The big problem here was to get extra bond-strength at the edge of the wheel. In this manner, the wheel holds its shape. The corners do not break down faster than the center section." The wheel is unique in that it has a 1/16" hard shell on each side to hold the corners. This was the result of a special modification of Bay State's resinoid bond.

Under regular production conditions, this 10 x ½ x 3 wheel is now helping Kennametal turn out more precision-finished carbide pieces at lower cost than ever before. And it was *lower cost and superior performance,* not claims that sold Kennametal's General Superintendent, F. J. Lennon, who says: "We have just one policy on buying diamond wheels here and it's simply this—every wheel is permanently on test. We will settle for absolutely nothing less than the best at any time."

That policy suits Bay State representatives perfectly. Like Howard McGlory, they are all thoroughly trained abrasive specialists who are willing to work hard to produce convincing results. *Better grinding at lower cost . . . that is their business.*

Bay State's 10 x ½ x 3 hard-sided diamond wheel grinding cemented carbide inserts. The leading edges of the wheel must stand up with maximum life and efficiency and still meet the fine finish requirements.



This 34 page catalog is yours for the asking. It contains a great deal of helpful information, including prices. Send for a copy today.

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WHEELS of PROGRESS

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When you "Put it on the Blanchard"
. . . be sure to use Blanchard Wheels

Your Blanchard Surface Grinder is designed to give you peak production and economy on hundreds of different grinding jobs. But, for every job you run, *there's one particular wheel that does it best!* That's why Blanchard manufactures and stocks a wide variety of silicate, resinoid and vitrified bonded wheels and segments.

Your Blanchard representative will be glad to help you select the wheel—or wheels—best suited to *your* grinding operations. Call or write him today. May we send you a copy of "The Art of Blanchard Surface Grinding" (4th Edition)?

THE BLANCHARD MACHINE COMPANY
64 State Street — Cambridge 39, Mass., U.S.A.

SHOP HINTS

Safety Switch Reduces Eye Hazard

By **Richard Minser**

● Individuals who operate bench or pedestal grinders only occasionally are not normally likely to be overly careful about wearing goggles while they are grinding. Generally there is only one tool to grind, and the man is in a hurry. This is a situation that is very likely to result in eye injuries.

A swinging glass or plastic shield is a better arrangement, but even this is "too much trouble" for many employees.

All this foolishness has been eliminated in our shop by fitting the grinders with lights that can be turned on by a manual switch, but putting an auxiliary switch on the hinge pin of the guard, so that the guard has to be down before the motor can be started.

We have developed two methods for doing this, based on the nature of our grinders.

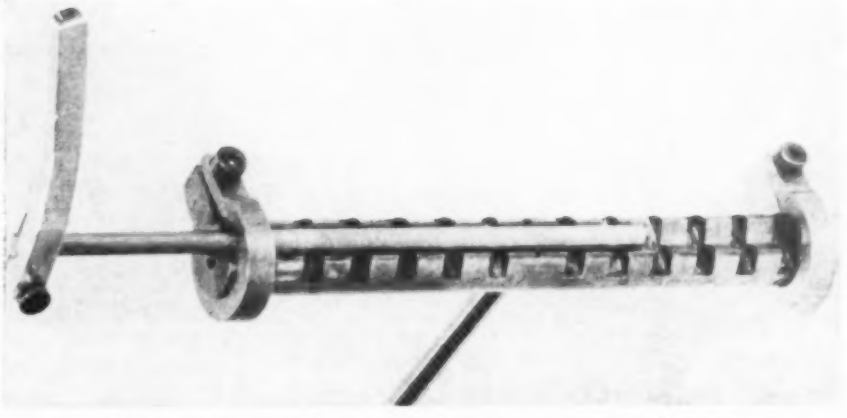
One type of grinder has the guard mounted in such a way that dropping it into place turned on the light. For these grinders, we rigged a separate switch for the light, and ran the "live" wire to the motor switch through this guard-operated switch. Thus, the light could be turned on by hand, but the guard had to be in place before the motor switch was operable.

For the second type of grinder, we replaced the original hinge pin in the guard with a longer one which operated a simple drum switch which was also added to the hot line to the motor switch.

The net result was the same in both types of installation.

In a few cases, the wheel guards were separate, one for the left wheel, one for the right. On these grinders, depending on the nature of the machine, we either connected the two with a long hinge pin, or replaced the two guards with one large one which covered both wheels.

This simple program has prevented many of the minor accidents which resulted in the past from untrained or careless individuals who were quite immune to our safety signs and warnings. •



Shaft to be ground is inserted part way into the fixture.

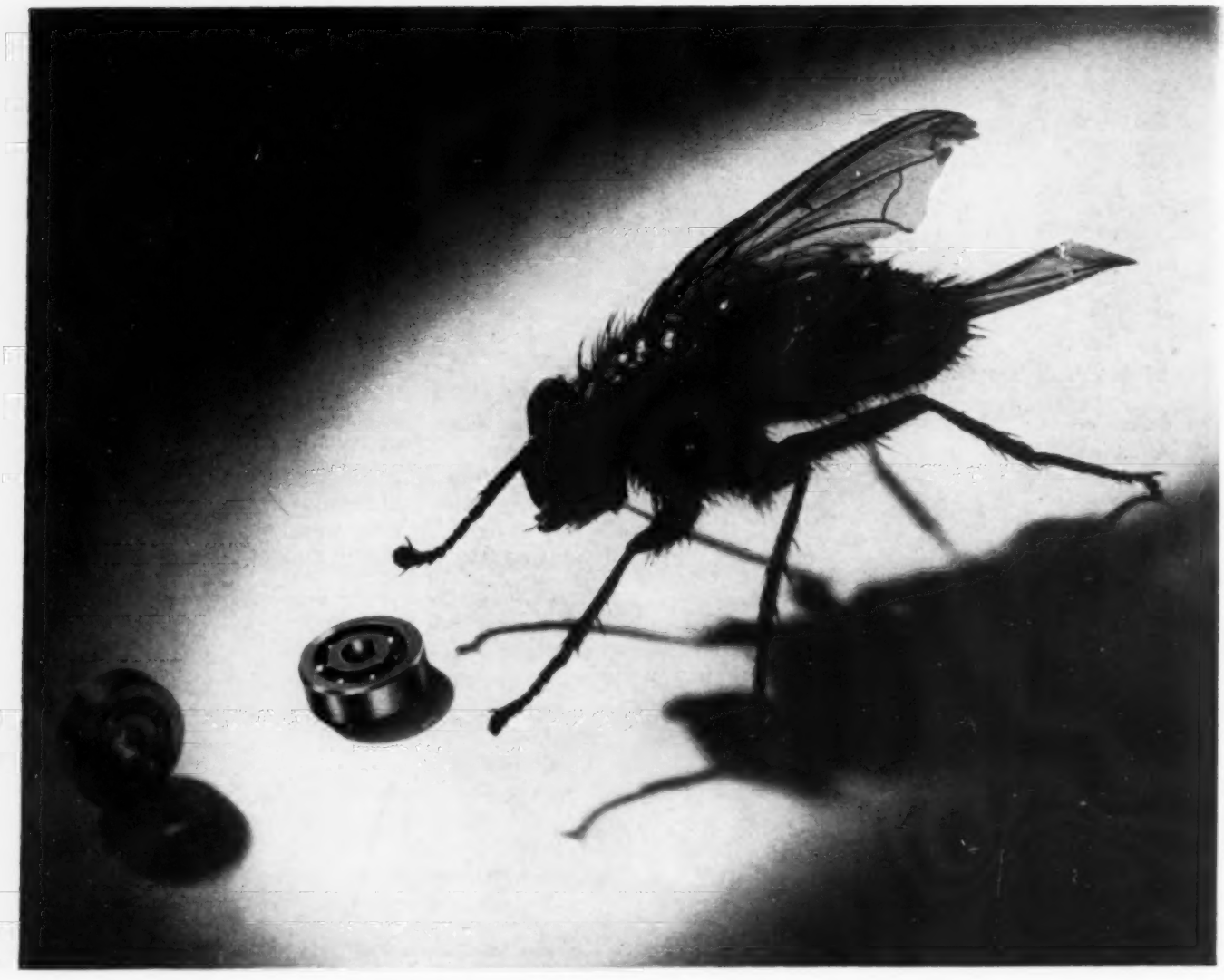
Supporting Device Improves Thread Grinding

By **Allan Young**

● One of the greatest difficulties encountered in thread grinding long lead screws is the fact that the grinding pressure forces the part to bend off center. Since the lead screw is supported only at the ends, some kind of back-up fixture is required between the centers to avoid this distortion. Such a device is illustrated above. It consists basically of a mild steel shaft with a 90° vee-groove machined in it. In this vee-groove are mounted carbide inserts on which the part rests and revolves. At each end is a tool steel band which clamps lightly on the end of the part to hold it down and also to let it revolve without wobbling. At the center of the fixture is a shank which rests on the grinder bed to keep the fixture from turning.

The illustration shows a sample shaft to be ground with a driving dog clamped on it, inserted part way into the fixture.

Sometimes even the simplest of fixtures can solve the toughest of problems, and this is a good example. •



Can parts this small be barrel finished?

Dime shows relative size of typical bearing races.

Twin-barrel Almco Supersheen Model DBO-1A used by Miniature Precision Bearings to process tiny bearing assemblies. It's the ideal machine either for small lots of parts or large lots of small parts.

EMPHATICALLY, YES!

For example, precision deburring and finishing of small parts with ALMCO barrel finishing equipment is an important operation at the modern new plant of Miniature Precision Bearings, Inc., Keene, N. H.

M.P.B. makes miniature ball bearings, some with assemblies so tiny that 500 can be carried in a thimble. ALMCO precision barrel finishing equipment and methods are used to improve surface finish on the inner and outer races, as well as removing burrs, sharp edges and machining lines.

Production usually runs from 1,000 to 4,000 parts per load, and occasionally at from 5,000 to 15,000 parts per load.

SEND FOR FREE 52-PAGE BOOK . . .

Modern precision barrel finishing processes completely described. 52 pages of facts, photos, data and cost comparison charts. Send for your free personal copy today.

All told, millions of parts annually are finished the ALMCO way at Miniature Precision Bearings!

If you have a finishing problem with your parts, small *or* large, perhaps ALMCO has the answer. It's easy to find out. Just write us on your letterhead asking for an ALMCO sales engineer to call. He will arrange for your product parts to be run through detailed sample processing to determine what combination of machine, compound, media, cycle, etc., will produce the results you want, at lowest possible cost.

Or, if you prefer, send sample parts and specifications on results desired direct to ALMCO's main laboratory at Albert Lea, Minnesota.

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FOR ALL METALS

Users get outstanding benefits when they replace flammable, toxic solvents with IMMUNOL. The following is typical of the many case histories in our files: "We estimate IMMUNOL saves us $30,000 to $40,000 per year in materials, time and labor alone when used in tumbling stainless steel jet engine blades."

Get more jobs done... *faster, safer, economically*

• IMMUNOL does much more work—faster, easier and less expensively—than soaps, alkalies and flammable toxic solvents. It is a powerful wetting agent, the original non-alkaline, non-acid detergent and rust preventive that quickly cleans, degreases and rustproofs in *one* operation. Here's how you can use IMMUNOL:

• **AS A BUCKET SOLVENT** to remove oils, compounds, soils, greases, gummy deposits from any metal.

• **TO REPLACE SOLVENT AND VAPOR DEGREASING.** IMMUNOL is very efficient in this application. The metal will be rustproofed and operators will not be bothered by odors, skin irritations or the danger of fire.

• **TO REPLACE OR IMPROVE ALKALI CLEANERS.** IMMUNOL can be used in many places where alkali cleaners are used without alkali burn. It is also used as an additive to alkalies to reduce the time cycle.

• **FOR TUMBLING METAL.** IMMUNOL can be used (1) before tumbling as a cold dip to remove punch press oils (2) as a rust inhibitor for the barrel and parts (3) in the barrel as a cleaner (4) as a dip rinse.

• **TO REMOVE BUFFING COMPOUNDS.** IMMUNOL is very effective in this application.

IMMUNOL is inexpensive. Only a few ounces per gallon of water are required to produce a gallon of solution which can be used over and over again. Write, wire or call for a free sample.

There is a family of IMMUNOL *products that produces outstanding results in many other metalworking applications. We'll send you details on these applications, too.*

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Allison-Campbell

ABRASIVE CUTTING KNOW-HOW

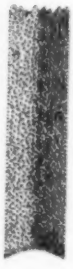
ACCO for Better Values

WHEEL EDGES TELL THE STORY!

NORMAL • *The right abrasive cutting wheel, properly applied, produces edges like these:*

Slightly rounded edge is a sign of the right wheel properly applied to the cutting of solid bar stock up to 12 inches square. You'll get fast cutting and long wheel-life with the right abrasive cutting wheel.

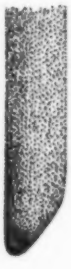
A wheel which retains its **square edge** is well-suited to cutting both—solids, and structurals or tubing of medium wall thickness. A good general-purpose wheel is required for these mixed cutting operations.



This **edge** is **slightly concave.** It should appear this way when you've used the right wheel to cut light tubing or other thin-wall sections. ALLISON wheels designed for this application make burr negligible.

ABNORMAL • *The wrong wheel, or improper application, produces edges like these:*

A **slightly pointed edge** means a wheel mismatched to the cutting job. A wheel which looks like this is too hard, doesn't break down uniformly. The tapering effect can produce wheel binding and breakage, and can burn the cut.



A **"chisel" edge** shows uneven wear, faster breakdown of the wheel on one side than on the other. It's the result of improper application of coolant in wet cutting. The result—shorter wheel life, and crooked cuts.

When the abrasive grain on the wheel edge wears smooth without being torn out, the **edge** becomes "**glazed,**" and the wheel loses its cutting efficiency. This condition is easily avoided by proper wheel application.

Abrasive Cutting Can Give You CLEANER Cuts—Faster

Cutting speeds of a few seconds per square inch, on almost *any* material, mean substantial time savings. Even titanium can be cut quickly and economically with the right abrasive cutting machine and wheel.

Fine finish obtained from abrasive cutting avoids burn, minimizes burr, and reduces or eliminates additional finishing operations.

Accuracy of CAMPBELL machines permits cutting within the closest tolerances, reduces rejects and scrap loss.

A complete selection of machines and wheels for *any* cut-off application is offered by ALLISON-CAMPBELL. Four types of CAMPBELL machines—chop stroke, oscillating, horizontal, and rotary—in capacities from the smallest stock to 14″ rounds . . . billets up to 12″ square . . . plate up to 6″ thick and 20 ft. long. ALLISON wheels—more than 150 different specifications—rubber or resinoid bond —3″ to 34″ diameters—.006″ to 3/16″ thick.

Application help is available from your ALLISON-CAMPBELL Field Engineer. His know-how is your assurance of the efficient, accurate, and economical cutting you can expect from modern abrasive cutting techniques. Call on him for expert advice.

WRITE FOR NEW BULLETIN

ALLISON-CAMPBELL Division has a modern, fully equipped Demonstration Laboratory in which your own cutting problems can be analyzed. Write for a copy of DH-20, a new bulletin describing these services. Details on ALLISON Abrasive Cutting Wheels and CAMPBELL Machines are also available.

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. . wherever abrasive operations are performed

Questions and Answers

FREQUENCY OF BALANCING

• How often is it necessary to balance a grinding wheel?—J. A. Flint

When limits of extreme dimensional accuracy and finish are no longer obtainable, in peripheral grinding, the grinding wheel should be balanced.

We are assuming that balancing of the wheel was necessary when it was first mounted. On some grinding operations, it is not necessary to balance the mounted wheel as it will be within the necessary operating limits.

Out of balance may result from non-uniform wheel structure, or from an accumulation of coolant resulting from a faulty coolant shut off valve, which allows dripping on one side of the wheel after rotation has ceased.

If caused by non-uniformity within the wheel, the condition will change as the wheel is reduced in diameter and frequent rebalancing will be required. •

FUNCTION OF STRUCTURE

• What is the function of "structure" in a grinding wheel?—B. J. Pittsburgh

The word "structure," as related to abrasive products, is the relative proportion of abrasive grain, bonding material and pores (air spaces). In other words, it represents a formula which the manufacturer follows in producing grinding wheels within more controlled limits.

It is not uncommon for users of grinding wheels to describe them as having open, medium or dense structures, and we assume that the question has reference to such characteristics.

The difference in appearance, in the lower structure numbers, is not discernible to the naked eye. Nor is there any great difference in the appearance of finer grit wheels in the more open structures. However, when we examine the induced pore type, there is a marked difference in appearance.

Generally speaking, because the more open structures, larger structure numbered wheels, have a lower percentage of grain, there would be a lesser amount of abrasive in contact with the work and a cooler grinding action. Because of the high percentage of bonding material, it is necessary to select softer grades, in the higher structures, in order to obtain an overall grinding action comparable to lower structure wheels. •

CAUSES OF DEEP SCRATCHES

• We get an occasional deep scratch in grinding alloy steels on a reciprocating table surface grinder. There doesn't seem to be noticeable coarse grit in the wheels. What else might be causing this condition?—R. K. Providence

The fact that you state that there doesn't seem to be coarse grit in the wheel, leads us to believe that you are finish grinding with much finer grit specifications than is ordinarily used for the purpose.

The occasional scratches that you observe may be caused by loose grit dropping out of the wheel guard.

Generally speaking, surface grinding on reciprocating grinders, is too often attempted with insufficient coolant applied to the wheel contact and work. Coolant is shut down to a mere trickle, and often misdirected to the wheel instead of the point of contact.

As a result, the grinding swarf and loose grain from wheel dressings, is not washed from the work surface. On the roll cut, this material may be imbedded in the work surface.

It would be our suggestion that the wheel guard be opened and washed clean, after wheel dressing, and that particular attention be directed toward the supply of a sufficient volume of coolant to insure a clean work surface. •

"CRACKING" A POLISHING WHEEL

• Why is it necessary to "crack" a newly set-up polishing wheel?—O. S. Utica

A newly headed or set up polishing wheel, when taken from the drying kiln, is as hard and inflexible as an abrasive wheel. Cracking or breaking either by machine or manually with a rod, is necessary to restore flexibility of the wheel as well as to improve its cutting possibilities.

CUTTING TRANSITE

• What recommendations would you make for a wheel to cut transite?—T. M. Cleveland.

In order to cut transite or any other material on a portable electric saw, it is imperative that the machine have sufficient power to maintain the proper wheel speed under load. Lots of power and speed will result in pinching the wheel in the cut and in breakage.

Transite has been very satisfactorily cut with silicon carbide reinforced resinoid wheels on stationary table cut-off machine, using a 37C24-V10BN wheel 16" in diameter and 5/32" thick. Such a specification should prove very satisfactory on a portable electric saw, in a wheel size suited to the particular machine. •

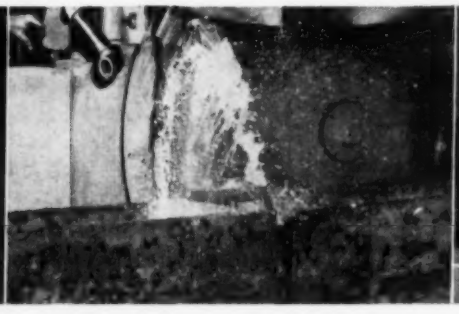
MATTISON
MACHINE WORKS
ROCKFORD ILL. U.S.A.

GRINDING METHODS

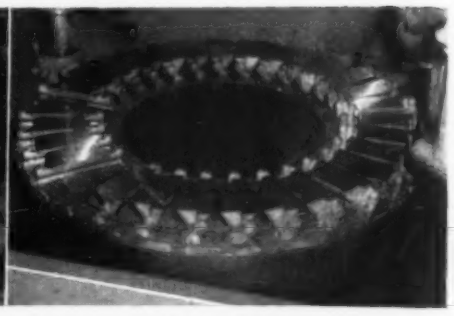
Discover new advantages in surface grinding!

increasing wheel pressures speeds stock removal, continuous cutting action eliminates tooling headaches!

Saves two milling operations—Thin-walled grey iron castings formerly required two milling cuts to remove stock without excessive springing; now they are finish-ground from the rough, two sides in one operation, at the rate of 17.4 per hour. Stock removal is .070 in. per side.

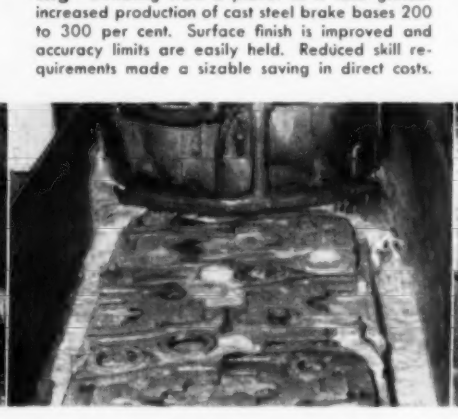


Grinding three times faster than planing—Switching from a planer to a face grinder increased production of cast steel brake bases 200 to 300 per cent. Surface finish is improved and accuracy limits are easily held. Reduced skill requirements made a sizable saving in direct costs.

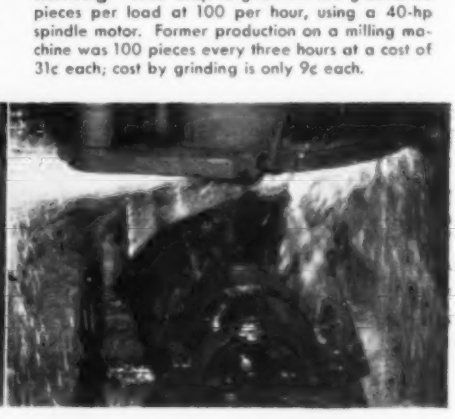


Grinding costs 22¢ per piece less than milling—4140 drop-forged links are ground 30 pieces per load at 100 per hour, using a 40-hp spindle motor. Former production on a milling machine was 100 pieces every three hours at a cost of 31¢ each; cost by grinding is only 9¢ each.

Eliminates springing under milling cutter—Cylinder front covers are machined on a four-spindle grinder at the rate of 240 surfaces per hour. Rough, semi-finish, and finish cuts are taken on the engine face, pan face, and water pump body face with only a single pass through the machine. Continuous cutting action increases accuracy.



Doubles production of parts formerly milled—Production was increased from five parts an hour to twelve on a surface grinder. Diesel engine timing gear housings are rough-ground to within .010 in. on both sides and then finish-ground on the same machine. Seven castings are machined per load with greatly reduced setup time.



Grinding dies saves $3640 per year—Heavy forging dies, formerly machined on a planer, are refinished on a 100-hp surface grinder with appreciable savings in labor costs annually. Dies are made of tough nickle-chrome-molybdenum steel. Holding fixture permits grinding the bevel edges by tilting the die.

If you can visualize grinding jobs like these in your shop, you will probably find not one, but several, ways to reduce costs.

Take any flat surface. The most important question is whether a grinding wheel will give you stock removal. You already know it will improve accuracy and finish. If the part can be held on a magnetic chuck, fixture costs will be lower and tool costs can be reduced because you rule out heavy intermittent cuts, friction, and heat. Cutter breakage, sharpening time, and short tool life will no longer be cost bugaboos.

New advances in grinding wheels

The reason surface grinding now challenges other machining methods, and why more horsepower can be used to speed stock removal, is that improved bonding techniques help today's grinding wheels hold their grits better under heavy cuts—then release the grits when they get dull, letting the wheel break down. Automatic sizing can be used to compensate for wheel wear and eliminate hand checking of parts. You never have to stop the machine in the middle of an operation or change the wheel until it is worn out. Thus, you can use higher pressures per grit (Fig. 1) without loading the wheel, keeping it open and free-cutting.

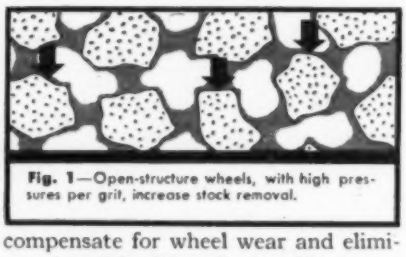


Fig. 1—Open-structure wheels, with high pressures per grit, increase stock removal.

Your open-structure wheels give you enough clearance between grits for removal of longer, thicker chips. Fig. 2 shows an actual chip obtained from a high-powered surface grinder. Note that the cutting action is similar to milling, only more and harder cutting edges are used to distribute the load and provide a smoother operation.

Many companies are designing new products for automatic assembly. Certainly, surface grinding offers many advantages by holding closer tolerances and minimizing skills needed to fit surfaces properly.

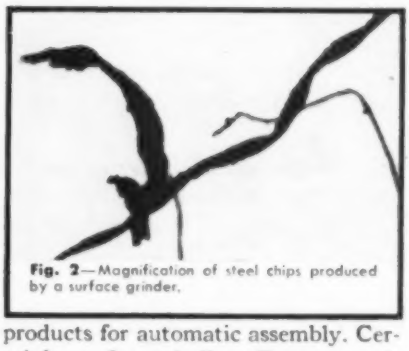


Fig. 2—Magnification of steel chips produced by a surface grinder.

WHAT JOBS ARE BEING SURFACE GROUND?

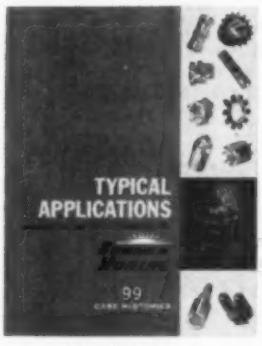
Let us send you this factual file of surface grinding case histories showing the wide variety of materials and parts being produced on a surface grinder. Ask for grinding "Setups" and address your letter to, or call:

MATTISON MACHINE WORKS
545 Blackhawk Park Avenue, Rockford, Illinois • Phone: 2-5521

wherever abrasive operations are performed

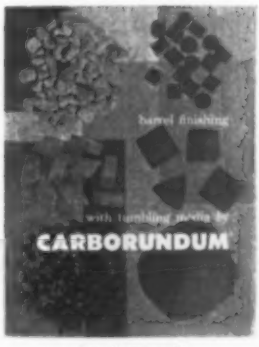
Free Literature

For further information on any of the literature listed here, use the handy postpaid card opposite page 82.



(See Number 1)

(See Number 2)



(See Number 3)

1. Honing Parts and Jobs. A 16-page case history booklet gives production rates, size, tolerance, stock removal and finish data on 99 diversified parts from ⅛" to 2¾" I.D. The manufacturer guarantees honing accuracy to .0001", with controlled microinch finish from 60 to 2. The problems shown cover many materials, and include parts with keyways, splines, and blind holes, indexed for quick reference. Photos are given of each part from screw machine work to castings. Sunnen Products Co., 7910 Manchester Ave., St. Louis 17, Mo.

2. Laps, Arbors, and Lapping Machines are described in recent catalog. Specifications and prices are given for helical slot laps and arbors, external laps and lap holders. Information for ordering lapping plates and abrasives is given. Internal, external and surface lapping machines are illustrated and discussed. As to the possibilities of the laps, lapping to .000005 on production parts and to .000001 on experimental tools can now be done within minutes with these laps. Lap sizes from 1/16" to 1¼" are stocked in the 64ths and to 3" in the 16ths. The external laps are stocked to 2". American Lap Co., 20180 Sherwood, Detroit 34, Mich.

3. "Tumbling Media for Barrel Finishing" is a practical 20-page handbook for supervisors and operators, based on the latest laboratory and factory case studies. It treats kinds of tumbling media; types of applications; types and functions of tumbling barrels; fixturing and linings for tumbling barrels; compounds and cleansers; do's and don'ts on the use of water; analyses of typical tumbling jobs. The booklet gives factual current case histories on removing paint and breaking corners; removing rust; improving finish; rounding corners; removing burrs, and removing heat treat scale. The Carborundum Co., Electro Minerals Division, Niagara Falls, N.Y.

4. "Techline Finishing Progress" magazine is devoted to precision finishing by barrel and wet blasting methods as well as applications of media, compounds, and abrasives necessary for either method. Volume 1, number 1, offers pictures and stories about the Techline division, its products and personnel. Illustrated stories relate details on close-tolerance mechanical finishing, the Techline laboratory equipped for analyzing precision finishing problems, and applications of equipment. Photographs show precision parts that can be rapidly finished in wet blast equipment. Also shown are metals and alloys which can be barrel finished. Wheelabrator Corp., 1169 Avenue V, Vicksburg, Mich.

5. A General Products catalog, replacing the earlier edition, is wire bound to ensure it will lie flat when opened. 88 pages list precision boring machines, custom and transfer machines, precision thread grinders, miscellaneous grinding machines and grinding equipment, jet blade profiling and finishing machines, vertical contouring machines, vertical boring machines, together with the Ex-Cell-O precision spindles. Ex-Cell-O Corp., 1200 Oakman Blvd., Detroit 32, Mich.

6. Electrolytic Metal Removal. A folder is available which gives a resumé of current information on electrolytic metal removal. Development of newer high-strength materials having tensile strengths of 200,000 to 400,000 psi have produced difficult machining problems. These metals are frequently sensitive to thermal damage. Electrolytic metal removal cannot cause this type of damage. What the process is, metal removal feeds and the equipment required are factors discussed. Illustrations are given of various spindles for hypodermic needle manufacturing, aircraft parts manufacturing, to name a few. The Standard Electrical Tool Co., 2488-96 River Rd., Cincinnati 4, Ohio.

7. Electronic Gaging Unit. Flyer available gives information concerning the Microtrol Transistorized Indicator, which is a small, portable, battery-powered electronic gaging unit. It features two ranges —0.006" to 0.0006" full scale—and magnifications of 770 X and 7700 X. Repeatability is reported as within 0.000004". The unit is diagrammed with specifications given. Industrial Products Dept., Airborne Instruments Laboratory, Inc., 160 Old Country Rd., Mineola, N.Y.

8. Automatic Saw Sharpener. Brochure describes the Hamco "3-in-1" saw sharpener which sharpens circular saws up to 16" diameter, band saws up to 2" wide, and hack saws up to 2" wide x 24" long. Illustrations picture the sharpener's operations as a circular, hack, and band saw sharpener. Standard accessories include two diamonds, wrenches, grinding wheel, and dressing stick. Specifications are given on the back sheet. Hamco Machines, Inc., 99 Mt. Hope Ave., Rochester 20, N.Y.

9. Cutting Oil Recommendations. Bulletin 21 recommends the proper cutting oil for automatic screw machines, boring, milling, drilling & sawing, broaching, lathes, and other machines. The six class designations are for mild steels—low carbon and free-cutting steels; medium steels—medium carbon and low alloy steels; hard steels—high carbon and high alloy steels; aluminum and aluminum alloys; brass, commercial yellow grades; and copper and bronze. Industrial Products Dept., Sun Oil Co., P.O. Box 1192, Albany, N.Y.

10. Diamond Pioneering is the title of brochure from the Koebel Diamond Tool Co. A history of the company in its pioneering diamond product advancements is given. Diamond has been used as the cutting medium for hard material, and recently the firm in developing the use of small diamonds in its products ties in the General Electric development of man-made diamonds. Diamond tools are illustrated with their specific uses, which include those using cemented diamond particles. Koebel Diamond Tool Co., 9456 Grinnell, Detroit 13, Mich.

FREE LITERATURE *continued*

(See Number 10)

(See Number 15)

11. Barrel Processing. Flyer available describes the Model RD/2 barrel machine for deburring, smoothing and grinding, radiusing edges, burnishing and polishing. Barrels are pressure molded in one piece and have no joints where particles can lodge causing contamination. There is a variable speed drive of 40 to 80 rpm, with a ¼ hp motor. Further specifications are given in the flyer, with features and usage. Casalbi Co., 540 Wayne St., Jackson, Mich.

12. USSSCO Safety Equipment. The United States Safety Service Co. has available a new catalog showing their various items of safety equipment and their research, production, and prescription laboratory facilities. Each item carries a complete description and suggested or recommended uses. The company's new location with larger expanded facilities is featured. New items which have been added during the past few months include: metal frame S-7 shape spectacles and "Pop Up" impregnated salt tablets with vitamins. United States Safety Service Co., 1535 Walnut St., Kansas City 8, Mo.

13. Generators, Submersible Transducers & Transducerized Tanks are described in folder. The complete SonBlaster line permits more than 100 combinations and systems. The units clean transistors, semiconductors, other electronic, automotive, missile and avionic components, instruments, timing mechanisms, optical and technical glassware—cleaning most mechanical, electrical or horological parts or assemblies. Specifications are given for the generators and transducers. The Narda Ultrasonic Corp., 625 Main St., Westbury, L.I., N.Y.

14. Barrel Finishing Machine. Bulletin 255 describes the Vibraslide barrel finishing machine. Illustrations and diagrams are given, with specifications. The feature of the unit is that while the finishing barrel is rotating (at a slow and less damaging speed), a vibrational force is incorporated into the barrel itself which allows the work to be done speedily with no damage to the parts being finished. Metal Finish, Inc., Newark, N. J.

15. Optical Comparator. Bulletin 1456C describes the Covel No. 14 optical comparator which permits quick, easy precision inspection right in the shop. All measurements are read directly from precision-built indicators. Photographs show the various features, and complete specifications are given. A surface illuminator.

to do small grinding jobs

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FAST...

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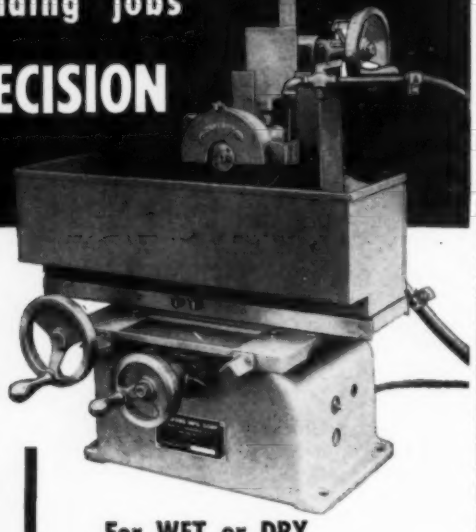
SANFORD
Model SG
SURFACE GRINDER



This unrivalled small parts grinder can be depended upon for micro accuracy. It's easy to use too . . . every hand wheel and operating switch is at your finger tips.

Designed and built by engineers and tool makers of rare foresight for tool, die and gage work, it has been constantly preferred after these many years of proven worth.

Write for fully illustrated literature, replacement parts and special attachments data with price list.

For WET or DRY grinding, specify optional equipment.

PARTIAL SPECIFICATIONS —

Chuck Surface—3"x5" or 4"x6".
Table travel — 8", traverse 4".
Vertical head movement — 6".
Work area under 4" wheel — 6", with chuck — 4".
Standard grinding wheel — 4" x ⅜" x ½".
Spindle speed—approx. 5500 RPM.
Motor, 1/6 HP, single or 3 ph., dynamically balanced.
Dimensions—23"x30"x27" high.
Net wt. approx. 160 lbs.

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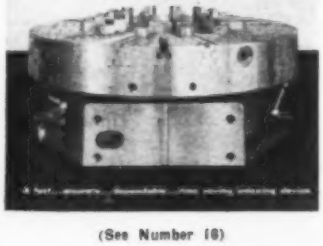


(See Number 16)

(See Number 18)

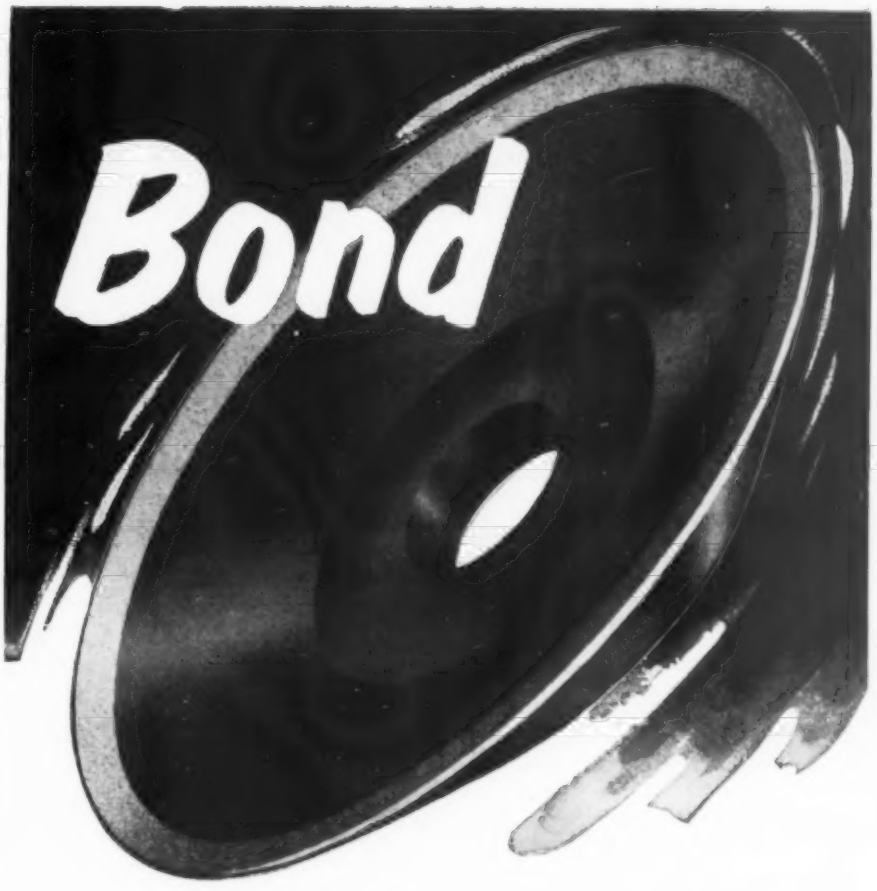
which projects two 500 W light beams on object to illuminate the surface, is available at extra cost. The attachments described are right- or left-hand centers and V-blocks and clamps. Covel Manufacturing Co., Benton Harbor, Mich.

16. Indexing Device. A new folder illustrates the basic 24" Super Spacer and attachments, with a complete parts breakdown and prices for component parts. The model has twin tapered roller bearings for easier indexing. Accuracy of one minute of arc is guaranteed. The chuck and angle bracket assembly are offered as attachments. Hartford Special Machinery Co., Homestead Ave., Hartford, Conn.

17. Standard For Diamond Dressing Tools. Officially known as "Diamond Dressing Tools," the new American standard covers classification, designation, definition, and shank dimension tolerances of diamond tools used for dressing or truing grinding wheels. General definitions and classifications, a system of designations using letters and numbers, are included, as well as shank dimension tolerances covering both straight shank and headed shank diamond dressing tools. American Society of Tool Engineers, 10700 Puritan, Detroit 38, Mich.

18. Barrel Finishing Compounds. An 8-page booklet discusses compounds as alkaline and acidic, abrasive and non-abrasive, designed for deburring, burnishing, and descaling metals in barrel operations. The booklet points out the correct combination of media, solution, speed, and loading. It tells how to preclean parts, how to select media for specific metals, shapes and sizes of parts, operations to be performed, and finishes desired. Oakite Products, Inc., 157 Rector St., New York 6, N.Y.

"Have you a wheel that will give me just a bit less stock."



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FREE LITERATURE *continued*

19. A Pocket-Size Conversion Chart shows at a glance the conversion of small angles (from one second to one minute) to micro-inches per inch, per ten inches, and per foot; and linear measure from one micro-inch to .005" in terms of minutes, seconds and fractional seconds, per inch, per ten inches and per foot. Engis Equipment Co., 431 S. Dearborn St., Chicago 5, Ill.

20. Grinder and Disc Supports. The 2 hp Nedco Sandbrute grinder, Model E-2, is described in available flyer. Complete with Nedco disc support, it weighs only 13¼ lbs. Disc supports, which absorb and deaden vibration, are described also. Prices and sizes are given for the 3" and 4" cushion type support for depressed center type resinoid discs and wheels. The Nedco Co., Waltham 54, Mass.

21. Air-Cooled Metal Center Buff. The Divine's Red D Buff has been improved in construction and an air-cooled metal center designed to fit it, according to folder. The new buffs run cooler and last longer, it is reported, and can be run at high speed without flying part. The folder also contains specifications of the material, and comparisons with other types. Divine Brothers Co., Seward Ave., Utica, N.Y.

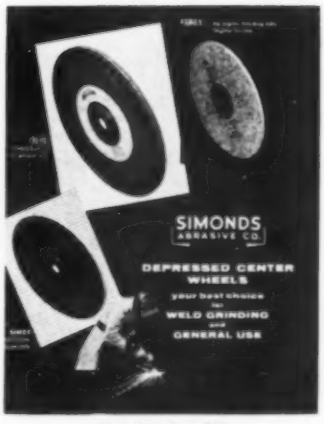
22. Dust Control. Bulletin 82 describes the Flexaust hose and Portovent duct for use in dust control. Material specifications and construction of standard types are given in table form. Hose types and duct types are given to select for light service-low pressures, severe service-heavy flexing, internal abrasion, etc. Industrial prices per foot are included, with accessory prices. Complete descriptions are given to help in ordering. Included are numerous photographs of uses of the hose and duct, including the Flexaust hose for grinding machinery, abrasive cut-off machines, reverse jet type dust filters, and dust collection. The Flexaust Co., 100 Park Ave., New York 17, N.Y.

"I warned you about getting nosey around that cut-off wheel operator!"

23. **Hand Feed Precision Surface Grinder.** Folder on the 612 surface grinder opens out with a large picture of the machine and arrows pointing to various features. Sections of the grinder are illustrated with descriptions of their operations. The grinder is equipped with sealed, anti-friction bearings throughout. There is a full 12½" work height from the top of the table to the underside of the 7" wheel, with 18" center distance on cross slide ways. The belt-driven spindle utilizes a 1 hp, 3450 rpm totally enclosed fan cooled motor. There is a double sheave on both the motor and the spindle to allow for either 2950 rpm or 3450 rpm if desired. Other Reid grinders are also illustrated. Reid Brothers Co., Inc., 137 Elliott St., Beverly, Mass.

24. **Depressed Center Wheels,** for fast grinding action on all kinds of steel, removing weld bead, excess metal, deburring, etc., are described in bulletin available. The Double XX type 27 wheel, fastest cutting for general use, is furnished in 7" and 9" diameters, 3/16" and ¼" thickness, with ⅞" depressed center hole. The Simex red wheel type 27, extra strong for heavy duty use, is available in the same dimensions, as well as the Fibrex red center type 27 wheel, for lighter jobs. The latter wheel also has ⅛" and ⅜" thickness. Method of grinding with the wheels is given, as well as instructions on how to order them. Simonds Abrasive Co., Tacony and Fraley Sts., Philadelphia 37, Pa.

25. **Power Brushes.** An 8-page booklet titled "Osborn TY Tools, a new concept of brushing tools for power finishing" tells the new TY brush story. The booklet shows typical applications and specifications. Many manufacturing operations that utilize such tools as rotary files, abrasive stones or belts, tumbling and shot blast machines, can be economically and more efficiently accomplished with the new brush, the manufacturer reports. Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, Ohio.



(See Number 24)

(See Number 25)

612
REID
HAND FEED
PRECISION
SURFACE
GRINDER

(See Number 23)

ATLANTIC WHEELS
spark new savings on snagging operations!

Take the toughest snagging operation you can find, add fast-cutting, cool-running Atlantic Grinding Wheels, and watch your grinding costs flatten out to a money-saving minimum. Made with a special resinoid bond to withstand high centrifugal forces, these work-proved wheels have a smooth, floating action that speeds up grinding . . . gives you cleaner surfaces with fewer passes.

Start saving now, by giving Atlantic Grinding Wheels a trial run in your plant. An Atlantic representative will gladly recommend the right wheel for your particular operation without obligation. Write for details and a copy of the **Atlantic Grinding Wheel Catalog.** Atlantic Abrasive Corporation, 532 Pearl Street, South Braintree 85, Massachusetts.

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New Equipment and Materials

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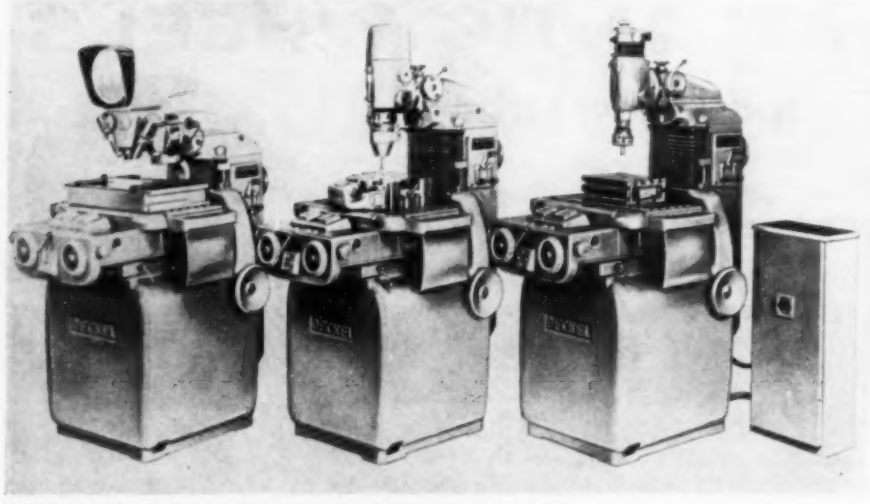
System Offers Interchangeable Heads With Direct Numerical Readings



Deckel LK Series optical measuring machine, jig grinder, and jig borer.

The Deckel LK Series provides simple interchangeability of jig boring, jig grinding, and optical projection measuring heads on one base; direct numerical readings of settings; and built-in compensation for thermal expansion.

The change from jig boring to jig grinding or optical projection measuring machines takes only minutes. Individual heads are mounted on an extremely rigid bracket supported on a rugged, heavy base. Any of the three types can be used as a single-purpose machine, or all three as a universal machine with but one base.

For the first time on any machine tool, table measurements can be read directly in numbers to ten-thousandths of an inch (.0001"), the manufacturer reports. This is accomplished by the ingenious projection of precision glass scale graduations through a system of lenses and mirrors. There are no conversions or interpolations—reading errors are said to be virtually impossible. Two projection screens, one for each of the two scales, are mounted on the cross slide. On each scale the desired readings can be set to .0001". Under test, operators have been able to obtain a reading accuracy of ±.00002".

The supporting bracket contains built-in compensation for thermal expansion to protect the inherent accuracy of the machines.

The boring spindle of the jig boring machine has 20 different speeds from 40 to 3150 rpm and six different feed rates either up or down. Maximum work height is 24".

On the jig grinding machine, the grinding spindle has 12 planetary motion speeds from 40 to 500 rpm and infinitely variable grinding speeds from 15,000 to 60,000 rpm. All types of grinding can be performed. The maximum work height is 18¾".

The measuring machine will perform all types of measuring operations. It projects images on a screen 7⅞" in diameter to a magnification of 10 or 20X. The measuring table data area is 18.7"x10.6".

A wide variety of accessories for each machine adds further versatility to the system.

Cosa Corp., 405 Lexington Ave., New York 17, N.Y.

Use postpaid card. Circle No. 101

Single Spindle Vertical Precision Grinding Machine

The 1200 Series machine is a fixed rail design and is available in two sizes and two models. The 1224 size has a 24" diameter table with 36" maximum swing capacity. The 1236/42 size has a 36" or 42" diameter table with 48" maximum swing capacity. The compound table has a swivel of 45° either side of center. The grinding spindle, in turn, has a swivel of 90° either side of slide center. This arrangement permits a wide variety of spindle-slide positions.

Each size is available with either a belt driven grinding spindle or a direct connected grinding spindle to suit a particular application. The belt driven model is especially suitable for bore grinding operations on parts such as gears, die sections, motor frames, and similar applications. The direct connected model is ideal for multiple grinding operations on I.D., O.D., and associated surfaces where the versatile feed directions of the spindle-slide spindles are available to suit a given application.

The machines are arranged to permit feed, traverse, and reciprocation in both horizontal and vertical directions. By means of selector switches, the following cycles can be obtained: feed horizontally, reciprocate vertically; feed vertically, reciprocate horizontally; feed horizontally only (plunge grind diameter); and feed vertically only (face grind).

The heavy-duty work spindle is guaranteed to an accuracy of .0001" at the spindle nose for super-precision, it is reported. Accurate control of work

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It's actually *easier* to reduce downtime and increase tool life with CFC Delpark Filter-Matic . . . for constant vacuum filtration of coolants, cutting oils, rolling oils, solvents and other fluids. Filter-Matic offers a wide selection of elements and filter media to assure the *perfect combination* for your operation.

Use of Leaf-Type *or* Tubular Screen elements is determined by the fluid viscosity, dirt load and proper vacuum required for maximum filtration. Additional control is provided by variety of metal screen or natural fibre filter media. Dual manifold design allows *continuous* filtration.

For the assistance of a Commercial Filters engineer, write to Department GF.

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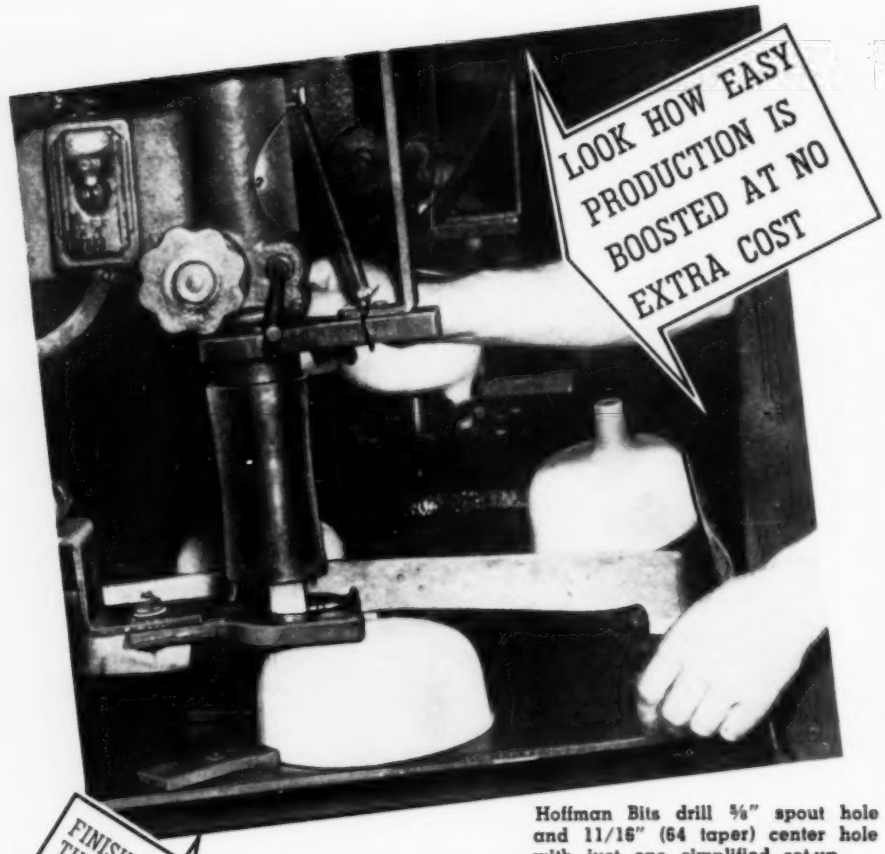

Hoffman Bits drill 5/8" spout hole and 11/16" (64 taper) center hole with just one simplified set-up.

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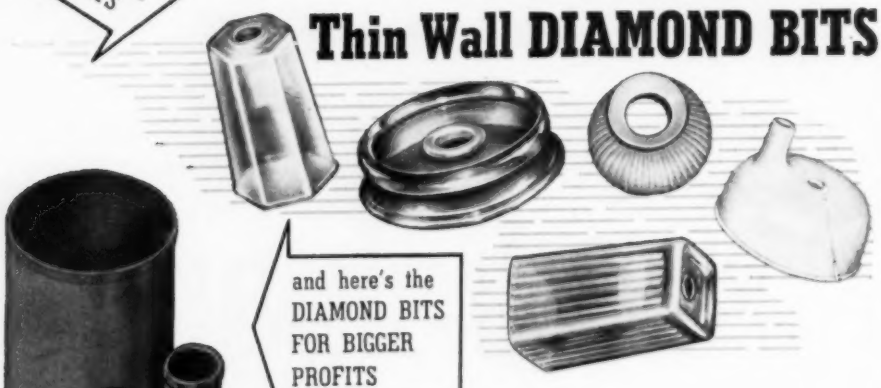
Thin Wall DIAMOND BITS



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. . . thin wall diamond surface set or impregnated bits for drilling and finishing the hardest materials

Hoffman Thin Wall Bits assure the highest production per bit available anywhere . . . because every bit is designed for the specific job. They produce the efficient, close tolerance results that cut job-time . . . eliminate many reject losses. Put Hoffman Bits to work and see why so many producers are setting new profit records in drilling and finishing glass, ceramics, porcelain, quartz, concrete and many others.

Scientific tests for hardness, cutting ability, etc. of customer's products are made in Hoffman's Laboratories at NO CHARGE. Send a sample of your own product material for testing at no obligation . . . or write for FREE literature.

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102 Cedar Street **Punxsutawney, Penna.**

NEW EQUIPMENT *continued*

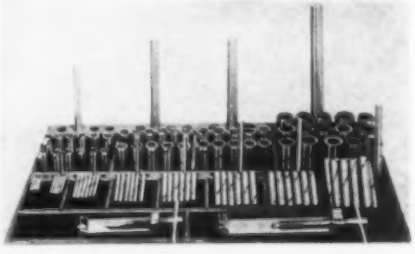
spindle speeds is obtained by means of an electronically controlled motor drive. A 3 hp, DC motor is provided on the 1224 size, and a 4 hp, DC motor on the 1236/42 size. Infinitely variable spindle speeds of 2 to 235 rpm on the 1224 size and 2 to 200 rpm on the 1236/42 size are obtained by means of potentiometer control.

The Model 1236D grinder is shown with spindle-slide positioned.

Frauenthal Division, The Kaydon Engineering Corp., Muskegon, Mich.

Use postpaid card. Circle No. 102

Helical Slot Laps



The helical slot in the lap produces uniform lap expansion the entire length of the lap, giving faster lapping action and longer lap life because the entire area of the lap is in contact with the work. The lap is expanded by driving it up on the tapered arbor.

The internal taper of the lap with the helical slot fitting on the tapered arbor permits true expansion of the lap. Over-all expansion eliminates any out-of-round condition and removes any difficulty in lapping accurately. Laps that are not expanded uniformly the entire length and diameter never lap truly round and straight.

Helical slot laps are made of annealed fine gray iron. These precision laps are available from stock from 1/16" to 1¼" in 64ths and to 3" in 16ths. From 1/16" to 1¼" the laps can be expanded to any of the in-between decimal sizes required. A set of 69 laps and 11 arbors can be obtained at $118.40 with which you can lap any decimal size up to 1¼".

American Lap Co., 20180 Sherwood, Detroit 34, Mich.

Use postpaid card. Circle No. 103

Polishing Wheel Lubricant

The Lea AP Lubar is an all-purpose bar lubricant for use on polishing wheels and abrasive butts. It applies to the belt easily and uniformly, leaving a good wet surface. Packing of abraded particles of metal on belts and polishing wheels is said to be eliminated.

Excellent results have been obtained in polishing ferrous metals and non-ferrous metals, particularly aluminum and other soft metals, according to the report.

The Lea Manufacturing Co., 16 Cherry Ave., Waterbury 20, Conn.

Use postpaid card. Circle No. 104

Depressed Center Abrasive Wheel

The Double XX depressed center abrasive wheel has been designed for weld grinding and general off-hand use on portable disc type sanders and right angle grinders. Made like a conventional grinding wheel containing the maximum amount of abrasive cutting particles, it is said to be extremely fast cutting and most popular for general use. The wheel is a rigid type resinoid bond wheel, doubly reinforced to give extra strength and durability.

The abrasive wheel is furnished in 7" and 9" diameters, 3/16" and 1¼" thickness, with ⅞" depressed center hole.

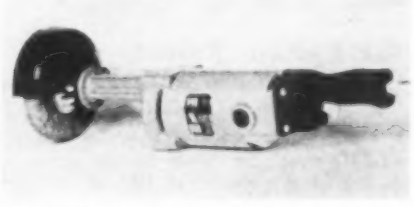
The wheel falls between Simonds' other center wheels—Fibrex for lighter jobs, and Simex for heavy duty use.

Simonds Abrasive Co., Tacony & Fraley Sts., Philadelphia 37, Pa.

Use postpaid card. Circle No. 105

Models of Straight Wheel Or Aerial Type Grinders

The Model A-2 heavy duty 2 hp straight wheel grinder is designed for use with high speed type 6"x1" abrasive wheel or with belt grinding attachment using 20"x2" belt. It features extra large ball bearings and hardened steel helical gears for smooth and quiet operation.



Specifications of the rugged, high speed unit include a no load speed of 7,000 rpm and spindle ⅝-11 rh. The grinder is complete with grinding wheel and guard (illustrated) or with belt grinding attachment. Optional equipment includes special wheels or belt grinding attachment having 4"x2" corrugated rubber contact wheel using 20"x2" belt.

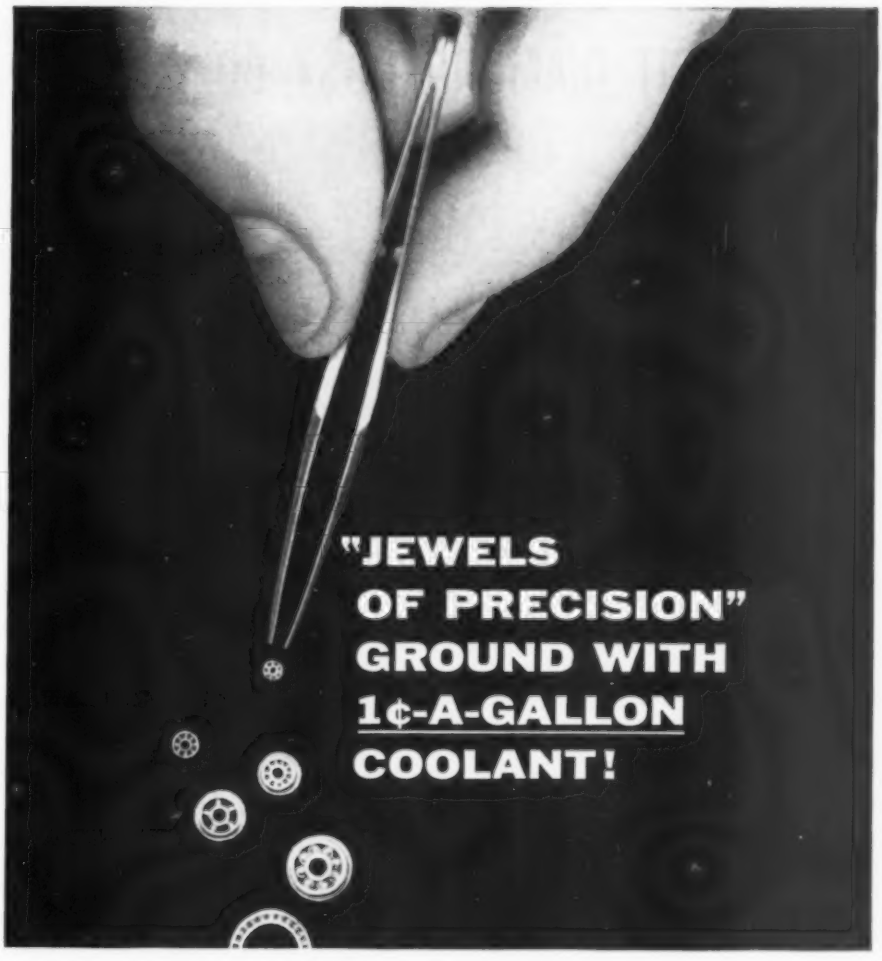
The Model A-1 has the same construction as the Model A-2, but has a 1½ hp motor. The optional equipment is the same.

The grinders are designed for use with high speed abrasive wheels for grinding rough castings and heavy welds, heavy-duty wire brush work, grinding off rivets, pins, and bolts.

The A-2 Model is priced at $140.00; the A-1 at $130.00; and the belt grinding attachment for either model, $70.00.

The Nedco Co., 27 Jones Rd., Waltham 54, Mass.

Use postpaid card. Circle No. 106



"We feel that White and Bagley 1500 is the best grinding liquid we have found!"

— Miniature Precision Bearings, Inc.

Machining of ball bearing assemblies so tiny that 500 can fit in a thimble is everyday routine at Miniature Precision Bearings, Inc., Keene, N. H. For such exacting work as precision grinding of tiny bearing races, W&B Grinding Concentrate 1500 is specified.

This entirely different type of coolant is normally diluted 1 part concentrate to 150 to 200 parts water. A 55-gallon drum of W&B 1500 provides up to 11,000 gallons of coolant — *at a cost of only 1¢ a gallon!*

Coolant made with W&B 1500 is transparent, and foamless as water. It provides excellent rust protection. Grinding is keener . . . machines stay cleaner. Chips settle almost instantly.

Mail the coupon for complete information about this outstanding coolant concentrate, being used by many of the country's largest manufacturers.

W&B INDUSTRIAL LUBRICANTS

THE WHITE & BAGLEY CO.
Worcester, Massachusetts • Detroit, Michigan
Originators of Grinding Lubricants

Sulphurized Fatty Bases
Grinding Coolants and Lubricants
Cutting, Grinding and Honing Oils
Forging Compounds

THE WHITE & BAGLEY CO., 88 Foster St., Worcester, Mass.

Please send me complete information on W&B Grinding Concentrate 1500.

NAME ..... TITLE .....
COMPANY ..... STREET .....
CITY ..... ZONE ..... STATE .....

☐ My plant has a tricky grinding problem on which we'd like advice. I've attached a letter describing it in detail. I understand that you offer this service without obligation.

NEW TORIT DIAMOND DUST COLLECTOR SAVES YOU UP TO 30% OF CARAT USAGE; COSTS ONLY $178.50!

Dust from these diamond wheels . . .

was recovered by this Torit Diamond Dust Collector . . .

at the rate of (50.5) carats in 14 days.

exclusive new centrifugal design simplifies recovery, serves all diamond grinding operations

Actually pays for itself in days. In an on-the-job test of this new TORIT equipment, the initial investment was returned in just 21 operating days. The test was conducted by a leading automobile manufacturer under regular operating conditions. Recovery averaged 30% of the carats originally contained in the diamond grinding wheels. You actually get a cash return of $1.00 for every $10.00 invested in diamond grinding wheels.

For all diamond grinding operations. This new TORIT Collector provides the same outstanding performance in all types of grinding operations—mist, wick or dry. Its design and operational simplicity also mean virtually maintenance-free service. Its tough construction assures long, long life.

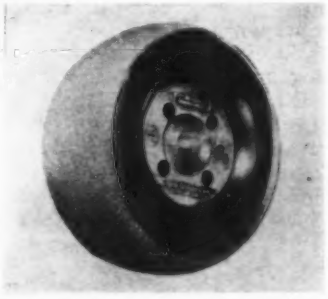
Installs anywhere. TORIT'S new Diamond Dust Collector can be used alone or in conjunction with central exhaust systems or unit dust collectors. It weighs only 65 lbs. and requires only 14" x 22" floor space. Its centrifugal separating action uses no filters or sloppy, inflammable oil baths. Service is quickly and conveniently performed by simply unscrewing the unit's top for removal and emptying of the clear plastic container.

FREE details and full specifications on request. Here's your chance to really save on your diamond usage. Write today for full information on this important new diamond grinding development.

TORIT MANUFACTURING COMPANY Walnut & Exchange Sts., Dept. 510, St. Paul, Minnesota

Crowned Finishing Wheel Does Work of 2 Wheels

A 5" diameter Valcore inflated finishing wheel has a new coated abrasive band in the center which makes possible polishing a concave surface with radius as small as 2". The wheel will handle many finishing jobs ordinarily requiring two wheels, because of the compound curvature.



The new band is designed for use with a Nu-Matic Model 525 which is 2½" wide. Crowned bands for the model are carried in stock in both medium and fine grits. Bands for other Valcore models are made to order.

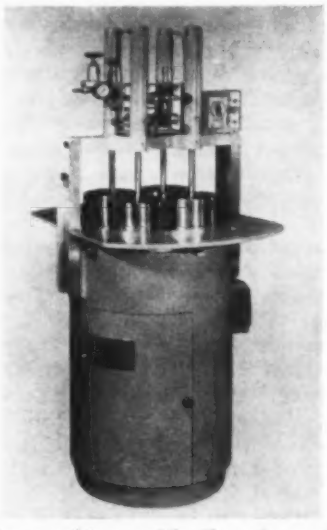
A Valcore Model 525 and a crowned abrasive band are available for a 25-day free trial. The customer should specify the type of power tool to be used, mounting hole diameter or thread size desired, and whether medium or fine grit abrasives are desired.

Nu-Matic Grinders Inc., 8224 Carnegie Ave., Cleveland 3, Ohio.

Use postpaid card. Circle No. 107

Air System Added To Lapping Machine

A manually operated air system is now an optional feature for the Speedlap 18 machine. This system can be added at slight extra cost to existing machines.



The machine, with the air system, can lap such materials as carbide, ceramics, including high alumina and

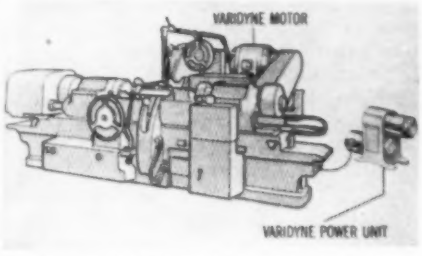
barium titinate ceramics; semi-conductors, hardened steel, aluminum, and other common material. Like the larger Speedlap 32, parts are ready for lapping as scintered, cast, stamped or turned.

The high productivity of the smaller machine now makes Speedlapping available to the smaller shop. The machine is suited for aircraft and missile parts, electronic components, instrument parts, as well as valve and seal faces.

Abrading Systems Co., 8020 N. Monticello, Skokie, Ill.

Use postpaid card. Circle No. 108

Grinder Control System Prolongs Wheel Life



The Varidyne Grinder Control, consisting of a U.S. Varidyne Power Unit and slave motor, is reported as eliminating the danger of grinder wheel overspeed. A standard 3-phase AC drive motor operating at variable speed is used.

The system automatically compensates for wheel wear by increasing the rpm of the grinder wheel as it wears, so that constant surface speed is maintained regardless of wheel diameter.

Because of a variation in hardness, some metals require low surface speeds while others may be run at higher rpm's. With the system, the grinder wheel rpm may be set at the power unit in a matter of seconds to meet the requirements of a particular metal.

U.S. Electrical Motors, Inc., Box 2058 Terminal Annex, Los Angeles 54, Calif.

Use postpaid card. Circle No. 109

Drum Top Sump Cleaner

Lower machine tool maintenance costs and mess-free sump cleaning are reported with the use of the Model DLO drum top sump cleaner. Vacuums

up to 275" water remove sludge, chips, coolant and oil from machine tool sumps directly into 55 gallon drums. Hand

HIS JOB ....TO BUILD YOUR PROFITS!

THE *Roto-Finish* CUSTOMER'S MAN

There's nothing unique about stressing product quality. But, at Roto-Finish we have an added incentive. The success of the Roto-Finish Customer's Man *depends* on providing the kind of dependable, mass-production finishing service which builds customer satisfaction, and results in a steady repeat business.

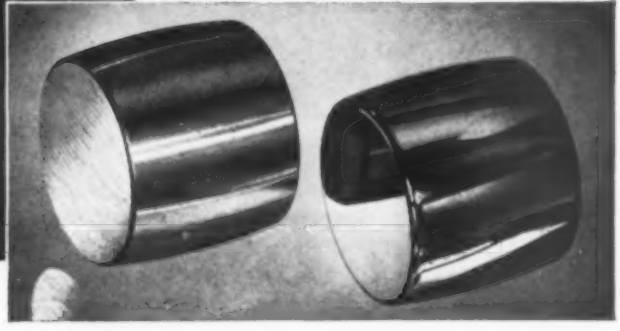
TRIAL AND ERROR FINISHING IS COSTLY

If you're new barrel finishing, our Customer's Man will welcome an opportunity to work with you in your own plant to show you how to get the finish you want, faster, and at lower cost.

If you're hand finishing, he can show you how to save up to 80% of your present finishing costs.

WANT PROOF? Then write or phone your Roto-Finish Customer's Man today.

ROTO-FINISH CASE HISTORY



*This photo is unretouched.

MATERIAL: Bearing steel, 61 Rockwell C Scale.
DIMENSIONS: 1.213" dia. x 1.015".
FINISH BEFORE: Ground to 10 RMS.
FINISH AFTER PROCESSING: 2 to 4 RMS, *(with no dimensional change).*

Roto-Finish COMPANY
3730 Milham Road
KALAMAZOO, MICHIGAN
Phone: Fireside 3-5578

ROTO FINISH

FOREIGN REPRESENTATIVES: ARGENTINA—Taller—Buenos Aires ● AUSTRALIA—A. Flavell Ltd.—Cheltenham ● BRAZIL—Commercial E. Industrial de Fornos Werco, Ltd.—Rio de Janeiro ● CANADA—Canadian Hanson & Van Winkle Co., Ltd.—Toronto ● ENGLAND—Roto-Finish Ltd.—Hemel Hempstead ● FRANCE—Societe Roto-Finish—Paris ● GERMANY, AUSTRIA, NORWAY, SWEDEN, SWITZERLAND—Metallgesellschaft A. G.—Frankfurt, a. M.—Germany ● HOLLAND, BELGIUM, LUXEMBURG—N. V. Roto Finish Maatschappij—Delft, Holland ● ITALY—Societa Roto-Finish a R. L.—Milan ● SPAIN—Instituto Electroquimico, S. A.—Barcelona

bailing and costly pump replacement are eliminated.

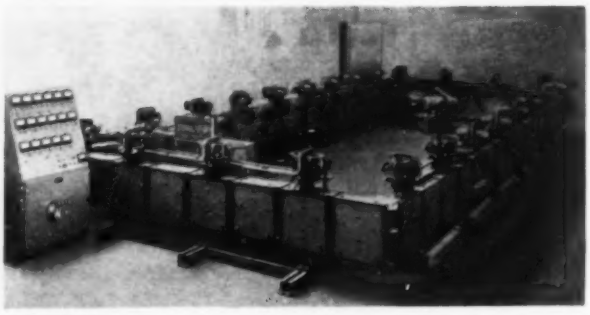
The cleaner operates on single phase electrical circuits, has a positive acting overfill control, and vacuum relief valve. The self-sealing lid fits standard 55 gallon drums. The 10′ electrical cord and 10′ suction hose are standard. The drum dolly is optional.

Tank models with 200 gallon capacities for air or electrical operation are also available.

Coolant Equipment Corp., Verona, Wis.

Use postpaid card. Circle No. 110

Multi-Purpose Conveyor Has Horizontal And Vertical Platens



A multi-purpose conveyor features platens which form an efficient protective seal with each other and with the frame, affording complete protection for roller supports, drive chains, and guides from destructive abrasives and dirt. The conveyor has horizontal and vertical platens and sealed line construction.

Available in rectangular or straight-line design, the conveyor can be equipped with continuous drive or variable station-dwell.

Wide versatility is possible by simply mounting fixtures on the vertical or horizontal platens or on both at the same time. Fixtures may be fixed mount, revolving or cam indexed, as desired.

Dependable electro-mechanized controls afford further flexibility and simple, accurate operation on all types of high production buffing and polishing.

Murray-Way Corp., Box 180, Birmingham, Mich.

Use postpaid card. Circle No. 111

BETTER PROFITS WITH KRAMER FINISHING EQUIPMENT

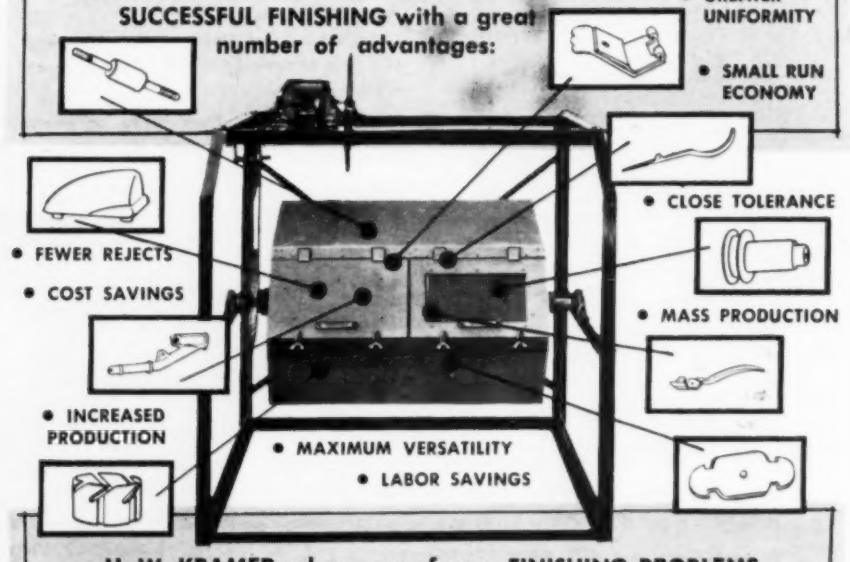
Development of New Methods Cuts Costs!

The greatest money-saving opportunities in Metal Finishing is yours now . . . in the use of H. W. KRAMER barrel Finishing!

Now, you can finish parts by the hundreds instead of the conventional methods that finish 1 part at the time. It's real easy work . . . it's childs play!

SAMPLE PARTS PROCESSED and a SPECIFICATION SHEET SUPPLIED TO THE MANUFACTURER.

Only Kramer's Tumblers & Buffers give you SUCCESSFUL FINISHING with a great number of advantages:



H. W. KRAMER solves any of your FINISHING PROBLEMS. Guaranteed prompt assistance in solving and determining the proper finishing procedure.

Write Dept. 76 for Free Literature.

Kramer

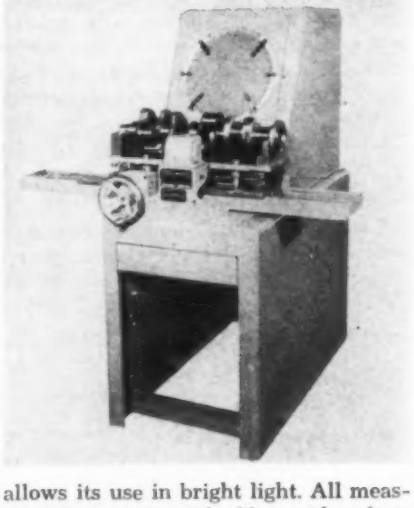
120-30 JAMAICA AVENUE, RICHMOND HILL, N. Y.

NEW ENGLAND REPRESENTATIVE
Russel E. Smith
98 Green Hill Road
P.O. Box #345
Westwood, Mass.

FLORIDA REPRESENTATIVE
Ace Plastic Materials
5541 NW 37th Avenue
Miami, Fla.

Optical Comparator Gives Exact Magnifications For Accurate, Direct Readings

The Covel No. 14 optical comparator permits quick, easy precision inspection right in the shop. Optic arrangement



allows its use in bright light. All measurements are read directly from precision-built indicators—one for horizontal measurement and one for vertical measurement. Human error is thus eliminated.

The optics are precision ground and coated, and images are sharp and bright. The object is always in direct magnification in relation to the power of the lenses. The standard lens is 25X. Other lenses are available at extra cost.

A surface illuminator which projects 500 W light beams on the object to

illuminate the surface is offered at additional charge. Right- or left-hand centers, and V-blocks and clamps, are attachments obtainable.

Illustrated is the comparator arranged with a special work holding fixture in place of the standard staging unit. The inspection being performed is that of checking the fillets in the five main crankshaft bearings, also the fillets in the crank pins. Hallation, a problem in optical inspection of this nature, was overcome by deviating slightly from the regular optical system.

Covel Manufacturing Co., Benton Harbor, Mich.

Use postpaid card. Circle No. 112

Small Bore Gages In .057" to 1.130" Dias.

The Set No. E-4 high-precision small bore gages cover a range of diameters of .057" to 1.130". The previous three sets were available for gaging sizes and discrepancies in bores of .057" to .828".

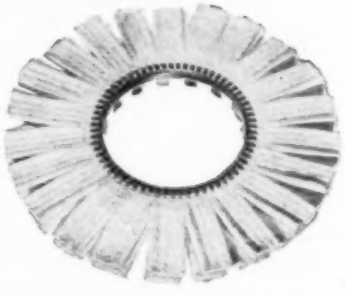
The bore gages are accurate to within .00008" and all sets overlap in size to assure complete range. All parts are obtainable separately.

The following accessories are obtainable: a right angle attachment, which permits gaging without removing workpiece from under the bore spindle; extension rods, which may be used to lengths of 30"; and depth adjusters, for readings to any defined depth.

Foster Supplies Co., 6122 Milwaukee Ave., Chicago 46, Ill.

Use postpaid card. Circle No. 113

Buff Abrasive Treatment Gives Depth in Cut



The abrasive treatment offers depth in cut and buff flexibility. By thoroughly impregnating the entire buff material, it efficiently applies cut in depth for uniform cutting surface at any stage of buff wear.

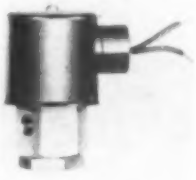
The super-flexibility feature is said to permit buffs to penetrate into crevices, recesses and grooves, and to follow all contours uniformly.

American Buff Co., 2414 S. La Salle St., Chicago 16, Ill.

Use postpaid card. Circle No. 114

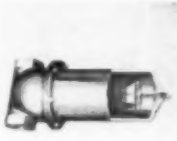
Cup-Type Safety Goggles. Eight new models of the goggles offer high impact resistance with good fitting comfort. A removable soft sponge face pad, with snaps at top and bottom of pad for easy replacement, assure sanitation when goggles are worn by more than one person. The four new chipper-type goggles have heat-treated Bal-Safe lenses, and perforated shields for ventilation. Bausch & Lomb Optical Co., Rochester, N.Y.

Use postpaid card. Circle No. 115



Direct Lift Valve. Called Type TT, "Tiny" is a single-seated, angle-type valve machined from brass bar stock. Direct lift operation (main valve ports open instantly when solenoid is energized) suits the valve for applications where pressure is coupled with little flow. Pressure range: 0-400 psi. Pipe sizes: ⅛" and ¼". Atkomatic Valve Co., Inc., 545 W. Abbott St., Indianapolis 25, Ind.

Use postpaid card. Circle No. 116



A Small-Size Hydraulic Filter, for filtering all types of hydraulic fluids, lubricants, fire-resistant liquids and coolants, is useful for hard-to-reach places. The filtering element is made from Monel wire mesh, with Monel support. All are Mono-Bilt into a single piece. This Mono-Bilt element is fitted into a housing of aluminum alloy. The filter is recommended for pressure of 175 psi. Capital Engineering & Mfg. Corp., 5837 S. Ashland Ave., Chicago 36, Ill.

Use postpaid card. Circle No. 117

Here's an interesting Idea-Book for you!

NEW!

Sundstrand Magnetic Chuck Catalog for Grinders

Manufacturers and owners of grinding machines will both find many time-saving and profitable work holding ideas in this new 12-page book.

Simplification of set-ups, powerful holding of heavy work plus many other features are included. Write for your copy today. Ask for Bulletin 397-M.

SUNDSTRAND POWER-GRIP

SUNDSTRAND MACHINE TOOL CO.
Magnetic Products Division
2531 ELEVENTH ST., ROCKFORD, ILLINOIS

18 Barrels Can Be Handled By One Operator

Speed-D-Burr Corp., manufacturers of barrel finishing equipment, have announced a compact Mity-Mite Installation for large production in limited space. Using Mity-Mite equipment, one operator working alone can handle as many as 18 operating barrels efficiently at one time. A centrally located jib boom provides rapid and easy handling of individual barrels between the mechanized units and unloading equipment.

The two sets of rollers on the Stubby models operate at different speeds and make possible simultaneous deburring and burnishing operations. Barrels may be added to or taken from either the Stubby or the Long Tom without disturbing the time cycle of other barrels on the same unit.

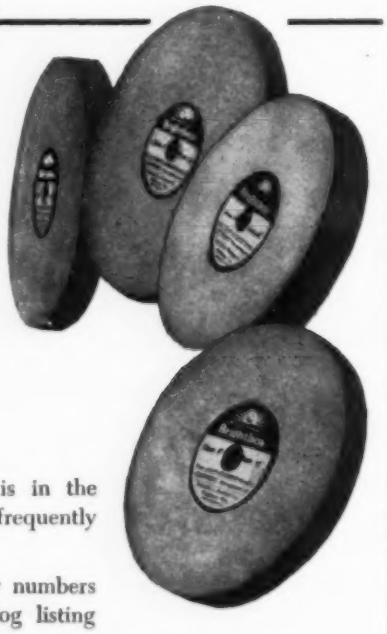
At the end of any run, the media is automatically screened and separated according to size for return to the media storage rack. Workpieces can be conveniently placed in the hot sawdust drying barrel in preparation for final inspection and shipment. Located within the same work area are racks for 8 to 12 extra Mity-Mite barrels, 15 media storage pans and 12 50 lb. drums of assorted compounds. Close proximity of extra barrels permits them to be loaded and ready for processing as soon as other barrels are removed, thus maintaining constant operation.

Sales Engineering Dept., Speed-D-Burr Corp., 3613 San Fernando Rd., Glendale 4, Calif.

Use postpaid card. Circle No. 118

IMPROVE YOUR PRODUCT AT LOWER COST!

Faced with a "Profit Squeeze"? Confronted with Price Competition?



Whatever your objectives, investigate cost saving, rubber cushioned Brightboy for a concept of wider abrasive applications. Brightboy's unique abrasive action (abrasive and rubber, working simultaneously) is saving time, reducing work operations for many, widely varied industries.

Brightboy is a STOCK line, readily available. Grades and textures JOB MATCHED to your requirements. Wheels, sticks, rods and blocks for machine and manual operations. A wide selection in Silicon Carbide and Aluminum Oxide grains. Each in grades from extra fine to extra coarse, in soft, firm and tough rubber binders. The compound is in the rubber. *No fuss, no muss.* A Brightboy finish frequently constitutes the final polish.

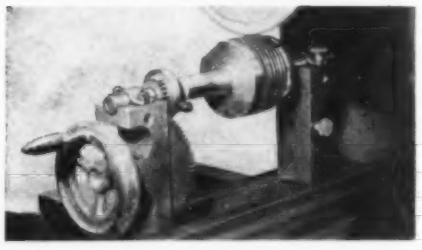
Ask your dealer to recommend the Brightboy numbers for your needs, and for the Brightboy catalog listing applications and machine speeds.

WRITE FOR FREE SAMPLE
BRIGHTBOY HAND PIECE
and
"Notes From The Brightboy Service Engineer." describing Brightboy applications and uses.

WELDON ROBERTS
Brightboy
RUBBER CUSHIONED ABRASIVES

BRIGHTBOY INDUSTRIAL DIVISION
WELDON ROBERTS RUBBER CO.
95 North 13th Street, Newark 7, N.J.
America's Pioneer Manufacturer of Rubber Bonded Abrasives

Grinding Centers For All Type Form Cutters



The 12½" long grinding center has a geared drive of 3 to 1 ratio. Dead centers while spinning are reported possible with the use of this grinding center for all types of form cutters. Its composition is base meehanite cast iron normalite, and precision ground.

If any wear occurs, the "V" can be retouched for perfect alignment.

The grinding center is priced at $87.00.

The Kell-Strom Tool Co., Inc., 214 Church St., Wethersfield, Conn.

Use postpaid card. Circle No. 119

Comparator Checks Clearances to Millionths

The Air-O-Limit 3-station ID-OD clearance comparator is said to check the clearances between the ID and OD of mating parts to millionths. It is a combination of two standard Model G—or Super G—Air-O-Limit gaging units (one ID and one OD), plus a computing circuit.

In operation, the output of the ID and OD units is fed into a multi-function computing relay, and the clearance or interference between the two parts is read on the clearance indicator in the center of the gage. Readings may be obtained quickly and clearly.

The clearance indicator may have double the magnification of the other two indicators, if required. For example, the ID and OD indicators may each have a full scale of .0002", while the clearance indicator has a full scale of .0001"—with each division equivalent to two millionths of an inch (80,000 x magnification).

The comparator is designed for checking precision mechanisms, such as servo valves, where clearances are kept to a few millionths of an inch.

Standard Air-O-Limit gaging plugs and rings are used in the ID and OD units.

Pratt & Whitney Co., Inc., West Hartford, Conn.

Use postpaid card. Circle No. 120

Die Sharpening And Polishing Machine

A die sharpening and polishing machine sharpens, polishes, and deburrs the sharp edges of cutting dies and polishes any inside or outside contour surface. It is also used for removing flashes from small die castings.

The machine uses a 42" endless abrasive belt, 1" wide, with a speed approximately 2600 fpm. Pressure can be applied against a removable solid or backing or spring tension behind the belt.

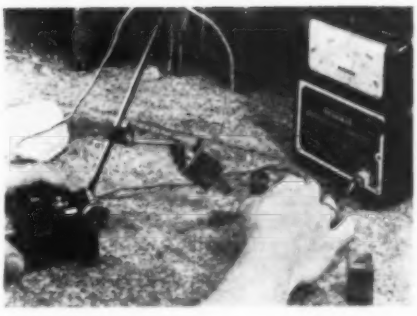
A ½ hp 60 cycle, single phase 3400 rpm dust enclosed motor is used. A switch is provided for forward or reverse operation.

Chicago Cutting Die Co., 2333 Nelson St., Chicago 18, Ill.

Use postpaid card. Circle No. 121

Additional Ranges for Portable Electronic Test Indicator

The Model 230 P-3 indicator, to supplement the previously announced Electro-Probe Model 230 P-2, provides additional measuring ranges for a greater number of applications. These ranges are ± .001" with .00005" graduations, and ± .0002" with .00001" graduations.



The instrument consists of the Electro-Probe gage head and lightweight, portable, battery-powered transistor amplifier, plus a carrying case. The gage head operates with a gaging pressure of less than 2.5 grams, eliminating the need for special fixtures or heavy-duty posts and columns.

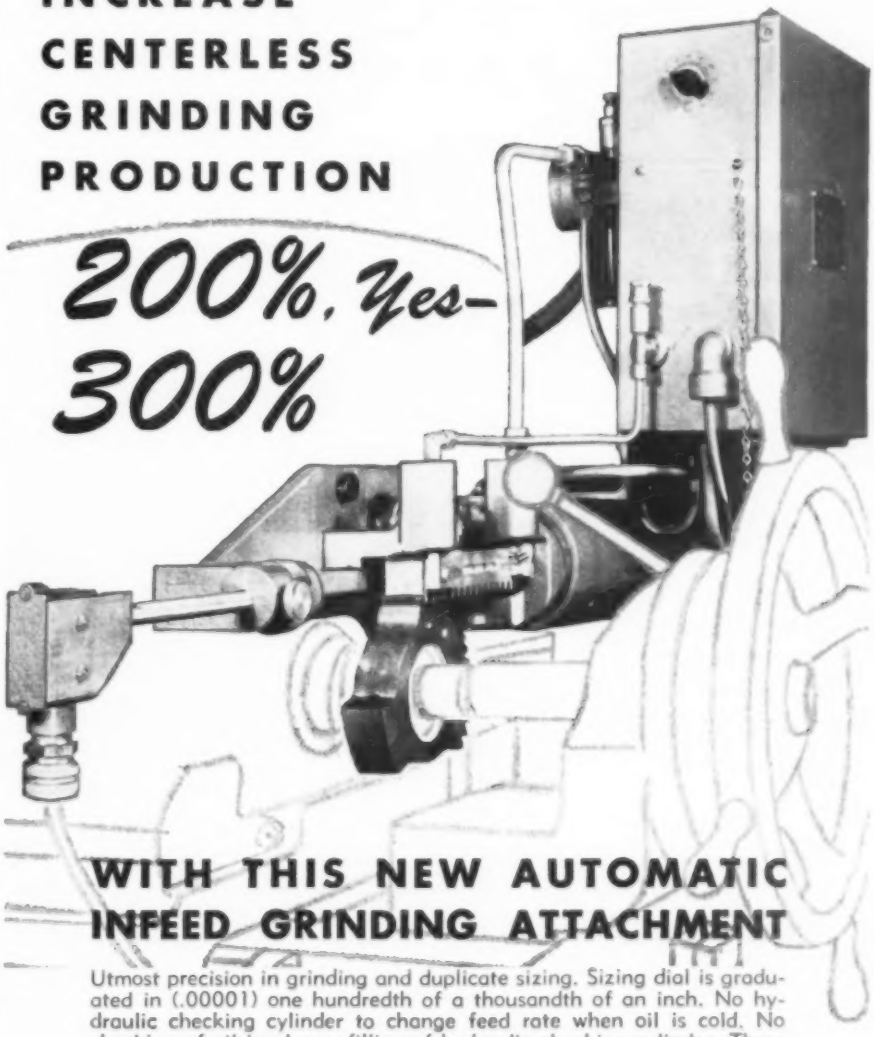
The indicator can be quickly applied to precision measurement on a surface plate or at the machine. Full-scale zero adjustment permits flexible positioning of the gage head and eliminates time-consuming mechanical adjustments, the manufacturer reports.

Federal Products Corp., 1144 Eddy St., Providence, R.I.

Use postpaid card. Circle No. 122

INCREASE CENTERLESS GRINDING PRODUCTION

200%, Yes— 300%



WITH THIS NEW AUTOMATIC INFEED GRINDING ATTACHMENT

Utmost precision in grinding and duplicate sizing. Sizing dial is graduated in (.00001) one hundredth of a thousandth of an inch. No hydraulic checking cylinder to change feed rate when oil is cold. No checking of oil level or refilling of hydraulic checking cylinder. Three (3) different feed rates are available in one unit for the fastest, most efficient, and precise sizing in a centerless grinder.

CAN BE USED FOR TRU-FEED AS WELL AS INFEED

for close sizing. Ideally located push button control station consists of Stop-Button, Start-Button, Caution Pilot Light, and a selector switch for set up or auto grinding positions. CATALOG Write for it today!

MODERN DEVICES

Subsidiary of TWENTIETH CENTURY MFG. CO.

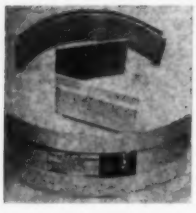
FEEDCISION

Box 429 GF Libertyville, Illinois

Open Territories for Manufacturers' Representatives

Swedish Micrometers. Johansson Swedish micrometers are available in .001" and .0001" graduations and each can be had either with carbide tipped spindle and anvil, or high carbon steel as desired. A special feature is their solid bronze inner sleeve, which eliminates friction between spindle and sleeve. Guaranteed maximum pitch error is .00004" and maximum error per inch is .00008". Hand grips to fit each model available at small extra charge. MG Tool Co., 80 White St., New York 13, N.Y.

Use postpaid card. Circle No. 123



Newly Designed Shot Blast Liners, called Blast-Mor, incorporates a patented analysis steel in areas of heaviest wear, combined with lower alloy steel in areas of minimum blast. They are manufactured from forged bars to reduce the wide performance ratios often found in cast liners. Blast-Mor is manufactured from a Latrobe patented wear steel, described by the company as "the most wear resistant steel known to man." The liner is a high carbon chromium die steel containing an unusually high percentage of both carbon and vanadium, for abrasion resisting qualities. Latrobe Steel Co., Latrobe, Pa.

Use postpaid card. Circle No. 124

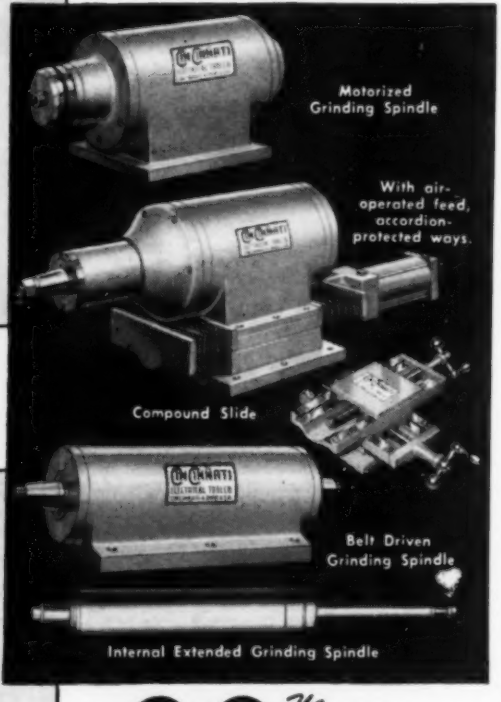
THERE IS NO PROUDER NAME IN MACHINE TOOLS . . .

CINCINNATI

FAMOUS SINCE 1902

. . . NOW on America's New line of Super Precision SPINDLES

GRINDING, BORING, DRILLING, MILLING, ROUTING, WORK HEADS



These are a few of the spindles MADE TO ORDER in recent years by CINCINNATI for tough jobs. These units have top performance records covering months and years of plant use.

We have learned our "trade" by solving manufacturing problems. Our application of a CINCINNATI SPINDLE can solve yours!

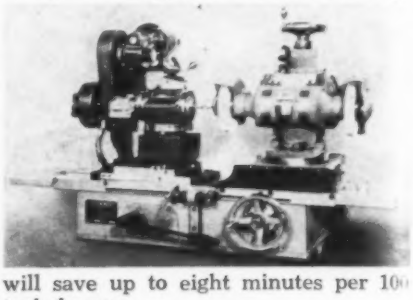
We invite your inquiries. Our new Bulletin S-58 is ready NOW, a portfolio of field-tested spindles, slides and feeds for every purpose.

WRITE TODAY!

The CINCINNATI ELECTRICAL TOOL CO.
314 MT. HOPE AVE.
CINCINNATI 4, OHIO

Air Actuated Collet Speeds Fixture Interchange

A non-rotating air powered collet closer for the R-O universal form relieving fixture speeds the job of interchanging tools and adapts the equipment to high speed production sharpening. Tests report that the new chuck



will save up to eight minutes per 100 tool changes.

The closer operates on shop air (60 psi) and is actuated by a double acting foot operated valve.

The chuck and draw bar assembly mount in the standard motor driven fixture without alteration. The draw bar rotates in the closer on a precision needle bearing and thrust is taken on two shielded ball thrust bearings.

Included with the closer is an air regulator, filter and oiler.

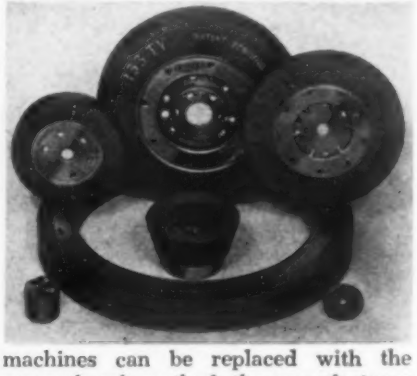
In the illustration, the chuck at left is mounted on the motorized fixture.

Royal Oak Tool & Machine Co., 29800 Stephenson Highway, Royal Oak, Mich.

Use postpaid card. Circle No. 125

Tool For Brushing And Abrasive Finishing

The Osborn TY power brush can be used not only as a wire brush but as an industrial tool for abrasive finishing. Manufacturing operations that use such tools as rotary files, abrasive stones or belts, tumbling and shot blast



machines can be replaced with the power brush method, the manufacturer claims. The bonding agent which encases the brush withstands severe brushing pressure and moderate work surface temperatures.

The power brush is said to have the advantage of greater tool life, greater brushing action strength, minimum wire breakage, and positive control over area of brush contact.

Industries such as metal fabrication, electrical, glass, rubber, plastic, shoe and machine tool will find the power brush of value.

The Osborn Manufacturing Co., 5401 Hamilton Ave., Cleveland 14, Ohio.

Use postpaid card. Circle No. 126

Coolant Cleaner

The Kebby Mite coolant cleaner features a magnetic retainer plate so constructed that heavy Alnico magnets and gravity tend to collect the contaminant in regular rows of tufts. These tufts act as filters to remove non-ferrous materials.

This magnetic separator has a capacity of 15 gpm of water soluble oil or chemical type coolant.

The $79.50 cleaner can be used on grinders, honers, gear shavers, broaches, milling machines, screw machines, and other machine tools.

Kebby Co., 2320 Custer Ave., Rockford, Ill.

Use postpaid card. Circle No. 127

Easy Set-Up of Gear Checker Provided By Built-In Optical System

The 1218A gear checker, easily set up by an untrained operator, precision checks gear leads from zero to infinity without multiple settings.

A built-in optical system is the basis of the easy set-up. A 56x scope, with graduated eyepiece, provides the precision reference against which the sine-bar plate is moved. Use of the scope permits setting of the sine-bar within 0.0001" of lead, and the plate is positively locked.

An integral recording unit provides a visual record of all checking data. It is mounted conveniently for ready reference.

The checker was primarily designed for external and internal helical gears and spur gears, but also checks either right- or left-hand leads on herringbones or worms.

The checking instrument has a capacity for gears up to 18" in diameter with shaft lengths to 24".

Michigan Tool Co., 7171 E. McNichols Rd., Detroit 12, Mich.

Use postpaid card. Circle No. 128

Grinding Fixture Grinds Double Margins On Drills, Reamers, Stepdrills

The Spira-Margin grinding fixture has a capacity for all letter, number, and fractional drills from 1/64" through 1/2". A larger capacity can be supplied on special order. Indexing accuracy is reported as within .0005". The fixture tilts and swivels to any compound angle desired. A large quantity of tools may be ground per day.

The fixture can grind special tools such as margins on step drills, flat bottom drills, ball nosing new end mills, to name a few, and is used on any offhand, surface, or cutter grinder.

Steptool Corp., 3613 E. Olympic Blvd., Los Angeles 23, Calif.

Use postpaid card. Circle No. 129

Hammond

DUS KOLECTORS MIST KOLECTORS

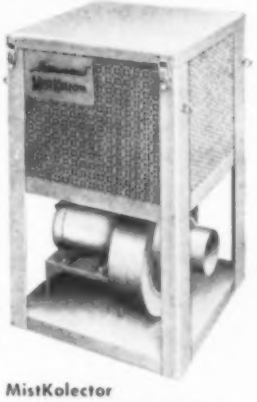
Cyclone DusKolector (other types available)

CAPTURE DUST and MIST

TO PROTECT EMPLOYEES' HEALTH . . . air pollution causes employee illness.

REDUCE MAINTENANCE COSTS . . . collect dust and mist at source.

PROTECT PLANT . . . dust and mist is an explosive fire hazard.



MistKolector

Write for Free Literature

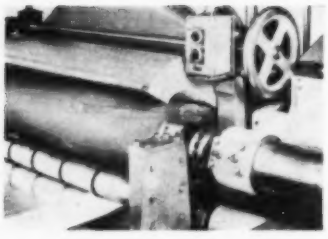
Hammond Machinery Builders INC

1651 DOUGLAS AVENUE • KALAMAZOO 4, MICHIGAN

Abrasive Rolls For Surface Finishing Machines

A spiral-wrap 9" dia. x 37" abrasive roll has been designed for complete interchangeability in nine of the ten different models of Clair surface finishing machines.

Removable cartridge bearings permit rapid installation and removal of the roll. Indexing clamps at each end of the roll secures the spiral-wrap and pulls it taut.



Roll installed in a model No. 209 Clair machine. The spanner wench is shown to better illustrate the method of pulling the wrap taut.

The rolls are interchangeable with the brushing, glazing, polishing or buffing rolls commonly used.

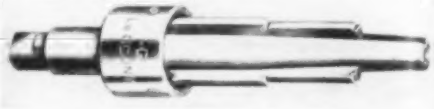
With each of the roll assemblies, the manufacturer will include a metal template to serve as a pattern for cutting the wraps from standard 21" width sheet abrasive stock, without waste.

Clair Mfg. Co., Inc., Olean, N.Y.

Use postpaid card. Circle No. 130

Expanding Mandrel Has Tolerance of .001" TIR

A new "G" type line of universal step-jaw expanding mandrels is designed to government specifications for use in smaller shops and for maintenance and repairs in larger industrial concerns.



All parts are hardened and ground for permanent precision; have a tolerance of .001" tir. A total of only nine mandrels provide a range of expansion from 3/8" to 7".

LeCount Tool Works, Inc., West Hartford, Conn.

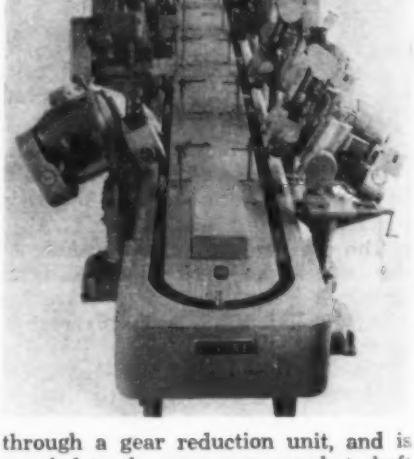
Use postpaid card. Circle No. 131

Circuit Conveyor For Polishing And Buffing Head Units

An indexing type circuit conveyor, for use with type L and type V polishing and buffing head units, is made sectional for rearrangement and ease in shipping. A complete conveyor would include a loading end section, a drive section, and a variable number of intermediate sections.

Two strands of heavy duty roller chain, running over double sprockets on vertical shafts in each conveyor end section, provide the conveying medium.

Indexing conveyor drive consists of a totally enclosed motor through a magnetic clutch and brake mechanism,



through a gear reduction unit, and is coupled to the conveyor sprocket shaft in the conveyor drive end. The action

accent on Accuracy!

Whitnon SPINDLE REPAIR SERVICE

*Restore your spindles to high quality efficiency . . . with Whitnon Spindle Repair Service

It's the accent on acuracy, too, that enables this radio telescope to locate solar activity millions of miles away

It's the *accent on accuracy*, also, that enables Whitnon Spindle Repair Service to restore *any* worn or damaged anti-friction spindle to its original efficiency.

Spindles of any manufacture are rebuilt with the same precise care and attention given Whitnon Spindles. Complete stocks of parts and bearings are maintained — and every effort is made to put rebuilt units back in shipment within rapid time.

Whitnon's new Detroit plant, 20466 Wyoming Ave., offers fast service to Mid-West manufacturers. This shop is air-conditioned, completely equipped, and staffed by Whitnon spindle repair experts. Convenient location saves you time and shipping costs.

WRITE FOR LITERATURE TODAY.

THE Whitnon MANUFACTURING COMPANY
ROUTE 6 AND NEW BRITAIN AVE., FARMINGTON, CONNECTICUT

of the brake and clutch is controlled by a pneumatic timer.

Time consumed in indexing from one station to another is kept to a bare minimum. The conveyor runs at maximum speed between work stations regardless of the number of indexes per hour.

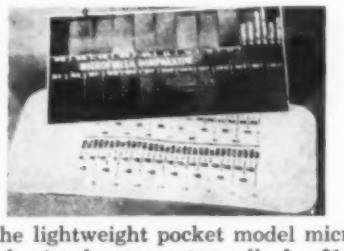
All speed adjustments are infinitely adjustable throughout their range. Also, when loading stations are used on both ends of the conveyor, production can be doubled in many cases.

As an optional extra feature, a continuous drive can also be had in addition to the indexing drive.

Divine Brothers Co., Seward Ave., Utica, N.Y.

Use postpaid card. Circle No. 132

Pocket Model Comparator For Inspecting Machined Surfaces



The lightweight pocket model microfinish visual comparator sells for $1.00.

The comparator is designed as a ready reference for the accurate inspection of machined surfaces. It has a total of 22 different examples of surface finishes which may be readily compared with the finish of the work being inspected. These finishes include: 3 lapped, 4 ground, 2 Blanchard, 5 shapeturn, 4 milled, 4 profiled surfaces. The decimal equivalent scale printed on the back is graduated in 64th's—from 1/64" to 1".

The comparator makes an excellent remembrance advertising gift. The reverse side is reserved for advertising the name, address, telephone number, and slogan or trademark of the donor. The comparator is available with or without advertising imprint.

Double T Products Co., 301 Acacia St., Hawthorne, Calif.

Use postpaid card. Circle No. 133

Magnetic Particle Inspection Equipment

The Peterson Sonoflux equipment is said to provide more positive identification of defects and speed up processing time and operation. The equipment is designed to meet the more critical high level inspection demands of the rocket age.

The quality-built crack and flaw detection units are now available in a wide variety of portable and booth-type magnetic inspection machines for non-destructive testing of ferrous materials.

Peterson Machine Tool, Inc., Merriam, Kan.

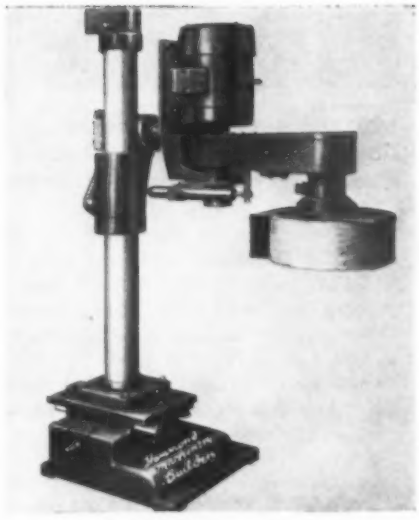
Use postpaid card. Circle No. 134

Heavy Duty Floating Type Polishing or Buffing Head

A heavy duty floating type polishing or buffing head is suitable to use on rotary automatic turrets or straight line conveyors where floating action on irregular shaped parts is required.

Illustrated is the Model 55-111 heavy duty floating head, optional power vertical unit.

The head is available with 10, 15 or 20 hp motor and multi-V-belt drive.



Hammond Machinery Builders, Inc., 1651 Douglas Ave., Kalamazoo, Mich.

Use postpaid card. Circle No. 135

Grind All Types of Profiles To Extreme Accuracy with Studer PSM's

PANTOGRAPH RATIOS

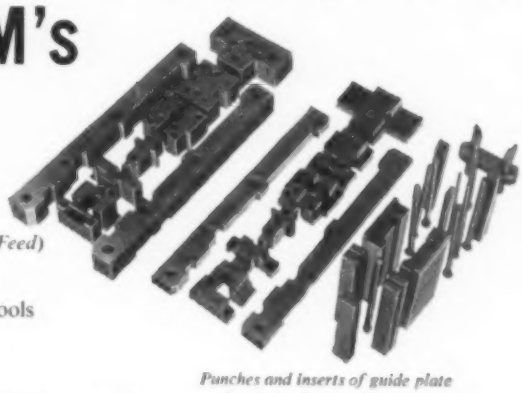
PSM 250 1:1 — 10:1

PSM 130 1:1—100:1

APPLICATIONS

(With Automatic Grinding Wheel Feed)

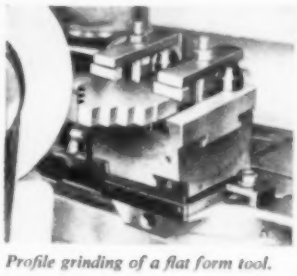
- Grinding of flat form tools
- Grinding of circular form tools
- Grinding of sectional dies
- Taper relief grinding
- Grinding of crushers or rolls between centers
- Grinding to complete 360° contours



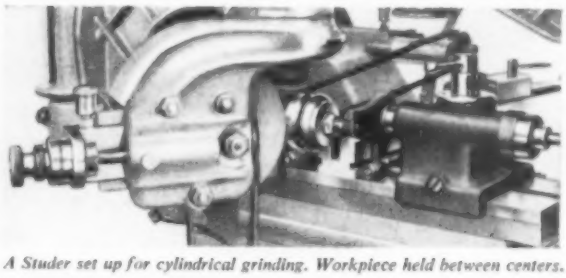
Punches and inserts of guide plate and cutting plate, with respective clamps—ground on a Studer.

ADDITIONAL SPECIFICATIONS

	PSM 250	PSM 130
Maximum template length	24"	16"
Profile length in one setting	16"	6"
Diameter of crushers or rolls	10"	4"



Profile grinding of a flat form tool.



A Studer set up for cylindrical grinding. Workpiece held between centers.

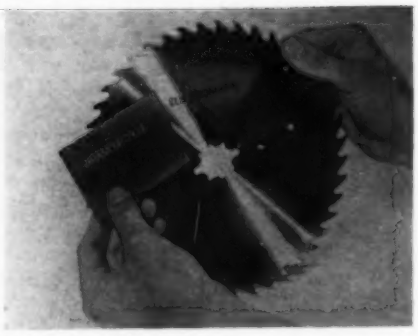
Write For More Information

COSA — *nationwide sales and service of precision machine tools—from bench lathes to boring mills.*

COSA CORPORATION, 405 LEXINGTON AVENUE, NEW YORK 17, N.Y.

Long Lasting Stencils For Marking Hard Metals By Electrochemical Process

The Polar stencil is said to last longer and not break down as conventional stencils have done, and so it is of value in the electrochemical process for marking hard metals. Letters or other line drawings, in the stencil, stay sharp and clear. The same stencil may be used again and again. High quality reproduction characteristics are maintained two to twenty times longer with the new stencil, the manufacturer claims.



Distinct permanent markings are made on hard metals such as carbides, stainless steels, titanium alloys, and on fine chrome or nickel finishes. By changing the electrolyte from one chemical to another, it is possible to have markings in color to contrast with the work being marked.

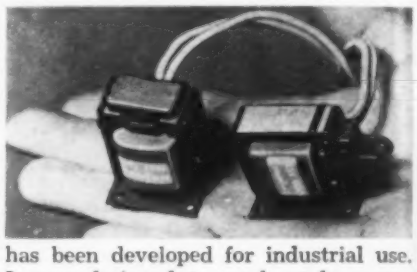
The economy effected by the use of the stencil is expected to make electrochemical marking available to a wider segment of industry, according to the manufacturer.

The Electromark Corp., 2093 E. 19th St., Cleveland 15, Ohio.

Use postpaid card. Circle No. 136

Long-Lasting Solenoids For Industrial Use

Illustrated is the new, long-lasting solenoid, a small electrical device that acts like a magnet when the electric current is pulsing through it, which



has been developed for industrial use. It was designed to work at long uninterrupted cycles for industry without costly breakdown periods, and has been accepted in both the electric timer and automatic door control fields. The O1 series produces a 1.7 lb. force at ½" stroke, and the O2 series, 2.4 lb. force at ½" stroke.

The silicon steel used in the solenoid was supplied by Allegheny Ludlum Steel Corporation of Pittsburgh. Proper coatings of the steel were used to provide inter-laminar insulation to reduce eddy current losses in the structure.

Detroit Coil Co., 2435 Hilton, Ferndale, Detroit, Mich.

Use postpaid card. Circle No. 137

Unbreakable Unit Inspects Non-Ferrous Metals

A multi-frequency equipment for high speed inspection of both non-ferrous

and non-magnetic metals was shown for the first time at the National Metal

for less than $200

equip your LATHE or similar machine for precision grinding WITH AN

Onsrud®

AIR TURBINE GRINDER

The 50,000 RPM ½ HP Onsrud D1-GB Air Turbine Grinder shown here, mounted on a lathe, provides surface finishes of 3 to 4 RMS in internal and external surface grinding operations. Construction features include pre-loaded bearings and dynamically balanced spindle. Governor control maintains full power and speed under load . . . gives air economy at idling.

For a total cost of less than $200 a precision-built Onsrud Air Turbine Grinder can be yours for low cost precision internal and external grinding on your lathe or similar machines. You'll find Onsrud Grinders have the extra power, speed and precision to more than do the job. Write for D1-GB Air Turbine Grinder Bulletin.

ONSRUD MACHINE WORKS, INC.
PORTABLE TOOL DIVISION
7736 Lehigh Avenue
Niles 48, Illinois
(Suburb of Chicago)

Onsrud® quality AIR TURBINE TOOLS

Exposition, Cleveland, Booth 1136, Oct. 27-31. The reportedly non-destructive unit is adapted for production line or independent testing of tubing, bars and wire for surface and sub-surface defects, physical and metallurgical properties.

The equipment has two frequencies operating simultaneously, with two flaw detection circuits and one property variation detection circuit for each frequency. The dual frequency operation, with a total of six inspection methods, permits simultaneous detection of a variety of flaws.

Inspection speeds range from 200 to 600 ft. per minute. Coils available test material from ⅛" to 3" outside diameters.

Magnetic Analysis Corp., 42-44 Twelfth St., Long Island City 1, N.Y.

Use postpaid card. Circle No. 138

Multi-Form Media Improves Barrel Finishing Process

Multi-Forms are designed for use in tumbling barrels for precision finishing of metal, rubber, and plastic parts.

The barrel finishing media reportedly enables faster and better deburring and grinding, and gives maximum surface contact, eliminates peening or rolling over of burrs.

The two basic shapes are triangles and cylinders of extruded or pressed abrasive grain. Other shapes will be made for specific problems. There are three types—type A is straight aluminum oxide; type B, a blend of aluminum oxide and silicon carbide, and type C, silicon carbide. Each of the types is also available in different grit structures.

Packaging is in 100 lb. bags.

BMT Manufacturing Corp., Elmira Heights, N.Y.

Use postpaid card. Circle No. 139

Rigid Angle Vise Holds 3,000 Lb. Torque Load

The Model 1A Wesson universal angle vise features new wedge-type movement locks, reportedly assuring setup rigidity up to 3,000 lbs. torque loading. The model combines extreme rigidity, high precision and low over-all height of only 5¼" with a 4" jaw capacity. Compound heavy, medium, or light-duty milling, drilling, boring and grinding operations are possible.

The cradle is very rigidly designed,

employing a massive dovetailed cradle and cradle support. It is designed to prevent chip clogging in machining operations.

For greater ease and simplicity of set up, all angular adjustments and locking are quickly accomplished with a single hex wrench. All graduations—accurate to ± 15 minutes—are clearly marked on stainless steel rings for permanent, easy reading.

Three separate angular adjustments are provided: 360° rotation of the base, 90° vertical range cradle adjustment, and 360° rotation of the jaw assembly.

Wesson Co., 1220 Woodward Heights Blvd., Ferndale 20, Mich.

Use postpaid card. Circle No. 140

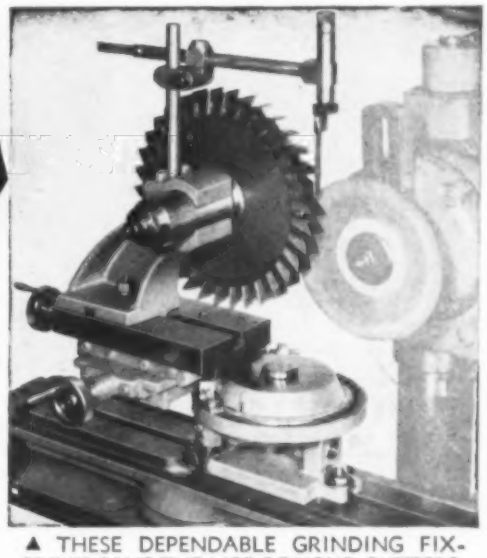
Cooling Solution Units From 1 HP to 100 HP

Complete packaged chilled water or acid cooling units are being manufactured for pre-cooling and temperature controlling of plating, anodizing, and chemical solutions. All Kol-Flo plating cooling solution units have completely insulated chillers as well as the cold coolant lines, enclosed control panel containing fully wired operating and

THE UNIVERSAL RADIAL CUTTER GRINDING FIXTURE

Does 5 Operations without removing cutter from its ARBOR!

On cutters up to 8" in diameter, the No. 6 fixture, as shown with our No. 6A heavy-duty, right-angle, ballbearing spindle workhead:
Sharpens side teeth on **both** sides.
Sharpens peripheral teeth.
Generates small or large radii on **both** corners of each tooth.
(Other workheads available)

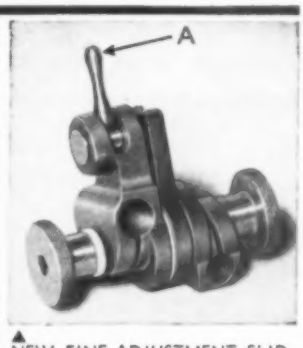


▲ THESE DEPENDABLE GRINDING FIXTURES SAVE THE LIFE OF YOUR CUTTERS. Write for our catalog 603

◀ UNIT 1A
This Universal Cutter Grinding Fixture fits any universal tool or surface grinder.

Radial Grinding Attachment D combines with Unit 1A for sharpening end mills with square, conical, or ball nose shapes. ▼

▲ UNIT 4A
Radial Grinding Fixture for sharpening fluted end mills with square, conical, or ball-nose mills. The index disc provides for multi-flute cutters.



▲ NEW FINE-ADJUSTMENT SLIDING SWIVEL GIVES SMOOTH, PRECISE INDICATOR SETTING. Smooth, positive positioning of finest dial indicator is readily accomplished by the fine-adjustment Sliding Swivel. Final precise positioning is accurately made by slight movement of convenient lever "A".
WRITE FOR:
SLIDING SWIVEL FOLDER

ROCHELEAU TOOL & DIE CO.
650 North Main St., Leominster 1, Mass.

safety controls for maintaining precise temperatures of bath solutions.

The components include a complete Freon refrigeration system, chiller, automatic electrical controls, internally piped and wired.

The units are available in sizes from 1 hp to 100 hp to meet all production operations. They are completely automatic, instant cooling, and temperature controlled. Chillers are manufactured in copper for cold water recirculation cooling, and stainless steel or lead for direct acid solution cooling.

Kol-Flo Kooler Co., Kol-Flo Bldg., Bayonne, N.J.

Use postpaid card. Circle No. 141

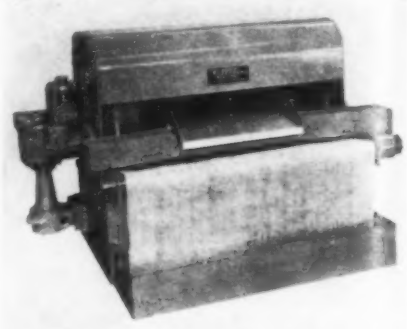
Combination Magnetic And Fabric Coolant Filters

A new line of Kleenall combination magnetic and fabric coolant filters features increased clearance between the filter fabric and distributor. This provides increased capacity for handling heavy swarf loads, reducing maintenance, and extending the life of the drive mechanism. Emphasis has been placed on anti-wear features and ease of access and installation.

On the drum drive shaft a separate sun gear is provided for ease of adjustment or replacement without removing the drive shaft.

A new style of belt support bracket has improved alignment and life of the fabric conveyor belt.

In the forward part of the filter, the drip plate has been relocated to provide greater clearance and better operation of the conveyor.



Two supports have been provided in the front and back of the filter at the base to provide lifting support during installation or moving.

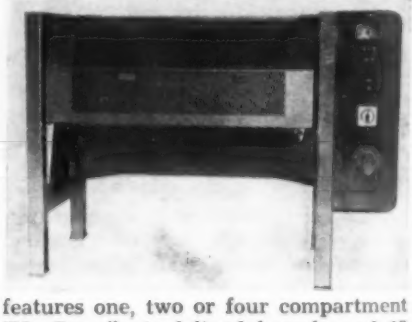
The filters are available in standard sizes and capacities as formerly offered, and are also adapted to central system installations.

Barnes Drill Co., Dept. 886, Rockford, Ill.

Use postpaid card. Circle No. 142

8 Cu. Ft. Cap. Finisher Has Selectable Compartments

Compartments of the Model V8 finishing machine can be readily interchanged for special finishing needs. It



features one, two or four compartment "No-Seam" vinyl-lined barrels and 12 to 36 rpm variable speed. The built-in speed changer provides precision finishing. The multi-compartment barrels permit simultaneous processing of different type workpieces in one machine.

Rampe Manufacturing Co., 14915 Woodworth Ave., Cleveland 10, Ohio.

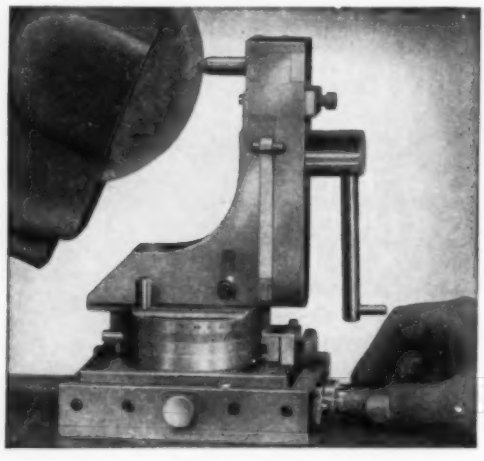
Use postpaid card. Circle No. 143

Tough Grinding Wheel Forms Dressed Easy as A, B, C

eliminate elaborate set-ups and operations

.0001" ACCURACY

Fluidmotion
WHEEL DRESSERS
dress two angles tangent to a radius in one continuous motion



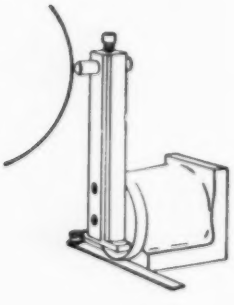
With the unique "Fluidmotion" Dresser, you can dress two angles tangent to a radius — using one handle in one continuous motion. Operation is so fast and simple that beginners can use them.

Adaptable to all type cylindrical and surface grinders.

A. Obtain micrometer reading; add required convex radius or subtract required concave radius.

B. Loosen jib with wrench and "mike" over lower pins to reading obtained above.

C. Tighten jib. Set stops for two angles. Ready for action.



Also available: "FORM MASTER" Dresser, capable of dressing any radii up to 12" convex, up to 15" concave.

See your industrial distributor or write for free literature.

J&S TOOL CO. INC. — CLAMPCUT

J & S TOOL CO., INC.
880 DORSA AVE.
LIVINGSTON, NEW JERSEY

"When I say, machine, grinding wheel and operator should work as a team, . . . I didn't mean. . . "

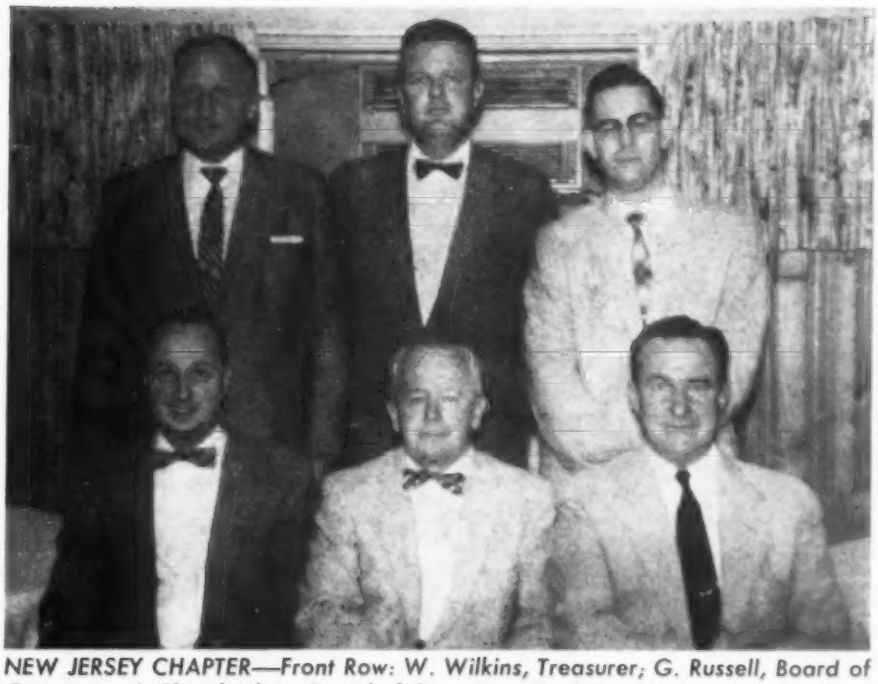
. . . wherever abrasive operations are performed

Abrasive Society News

Boston Chapter

The October meeting covered Allison cut-off wheels, and Mr. Cummings, Allison Sales Manager, showed a film along with his message. The November meeting, scheduled for the 25th, will be given by the Roto-Finish Co. of Kalamazoo, Mich. Don Duffney, the Regional Manager, will talk on barrel finishing and tumbling. The January 27 meeting will be concerned with the manufacture of man-made diamonds, with a talk given by a representative from the General Electric Co.

Philip E. Bloom was elected Chairman and **Vincent P. Tarushka**, Membership Chairman at the October meeting. The Treasurer is **Charles H. McQuarrie**, and the Ex-Officio is **Raymond H. Ryder.** Others who were elected to the Executive Committee are: **John H. Ciccolo**, Vice-Chairman; **Isaac C. Day**, Secretary; **John L. McAvoy**, Program Chairman; **Richard F. H. Clancey**, Publicity Chairman. Arrangements Chairmen are **Robert A. Lufkin** and **H. George Senning.**



NEW JERSEY CHAPTER—Front Row: W. Wilkins, Treasurer; G. Russell, Board of Governors; J. Chamberlain, Board of Governors; Back Row: J. Roman, President; H. Reynolds, Board of Governors; J. Cornell, Secretary. (Photo taken at a recent meeting.)

Flint Chapter Outlines Program

Chalmer C. Brown, co-chairman of the Program Committee of Flint, Michigan, Chapter of American Society for Abrasives announces the following program for the Chapter:

1. Sept. 24, 1958, "Man Made Diamonds" G.E. & Carborundum Co.
2. Nov. 5, 1958, "In and outside the Grinding Wheel" by Cincinnati Milling.
3. Dec. 17, 1958, "Electrolytic Grinding" with Ano-Cut.
4. Jan. 28, 1959, "Coolants and Cutting Oils" White & Bagley.
5. March 11, 1959, "Coated Abrasives" Carbo-MMM-BM.
6. April 22, 1959, Micromatic Hone Co.
7. June 5, 1959, Outing—Golf, etc.

ASA President Discusses Membership And Plans Of Society For 1958-59

John Y. Arnold, President of American Society for Abrasives, revealed at a recent meeting of ASA Directors, that membership had increased to more than 600 individuals and 36 corporations. A breakdown of membership shows that 80% are manufacturers and users, 17% are distributors, and 3% are unclassified. It is hoped that an intensive membership drive will increase membership from the "user" group in order to bring into sharper focus the problems encountered working with abrasives.

Although only in its second year, ASA has attained a modest but important place in American industry, thanks to its extensive program of technical and professional services as well as intensive activities at local levels.

Of course, past achievements are pleasant to contemplate—but the ASA is just beginning. During 1958-59 it will be necessary to strengthen the Society, to provide it with the means to continue and expand the program. Immediate goals are to increase membership and strengthen the financial position of the ASA. The challenges that brought the Society into being: the need for closer cooperation between manufacturers and users of abrasives, the need for standards, and the need to improve the efficiency and safety of abrasive operations can only be met by concerted effort of all interested in the growth and furtherance of abrasive manufacture and use.

wherever abrasive operations are performed

News of Industry

Abrado Finish Corp. Builds For National Market

The Abrado Finish Corp., formerly the Grand Rapids Tumbling Supply Corp., has just completed the addition of over 10,000 square feet of new offices, experimental laboratories, and manufacturing facilities to their plant located at 1750 Elizabeth Avenue, N.W., Grand Rapids, Mich.

Abrado Finish Corp.'s new $50,000 plant addition.

Experimental process machine in Abrado Finish Corp.'s new process development laboratory.

Several months ago the name "Abrado Finish Corp." was adopted to replace the former name used by the company since its founding in 1954 by **Wallace L. Reed,** President and Sales Manager.

C. Heamon Castle is associated with the corporation as Executive Vice-President and Technical Director. His background includes that of Technical Director for another well-known supplier of barrel finishing materials. He has devoted the last twenty-five years to process development for the metal finishing trade.

Others on the staff include **John Mulder,** Vice-President; **Ken Martinus,** Plant Manager; **George Thompson,** Processing Supervisor, and **Clare Vander Sloot,** Sales Engineer.

The technical laboratory is well equipped with the latest testing equipment. In addition, the firm has available modern, up-to-date facilities for demonstrations and for solving a wide variety of metal finishing problems.

In addition to supplying chemical compounds and abrasive media, the corporation is developing several new types of metal finishing equipment and accessory items. A new and radically different spindle type finishing machine, the Abrado-Matic, will be available soon for distribution throughout the United States by authorized distributors and their representatives. Formerly the organization served only the Mid-West throughout the U.S.

Literature on new equipment and price lists are available to all manuprice lists are available to all manufacturers interested in creative, low cost finishing.

Method For Shaping High Speed Tool Bits

A new, improved method for shaping high speed tool bits has been announced by American Diamond Saw Co., 1721 N.E. 38th Ave., Portland 12, Ore. They have found that strips of coated abrasives, combined with the cushioning action of their Cone-Loc drum sander, greatly reduces heating and removes material much faster than a hard grinding wheel. They now shape all tool bits with the Cone-Loc Drum Sander leaving only the sharp finishing operation for the slower, hard grinding wheel.

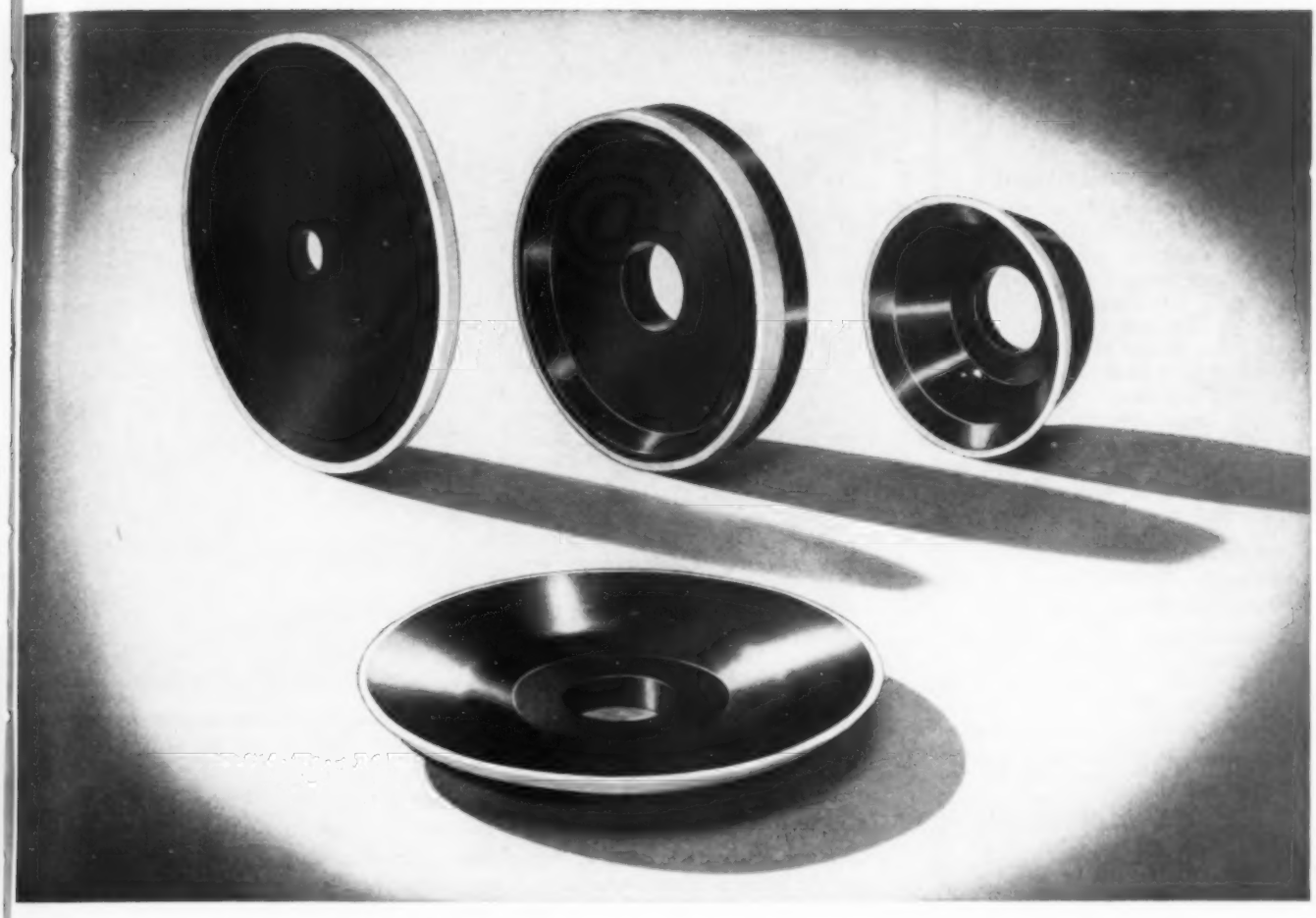
Cone-Loc Drum Sanders are now being sold and shipped direct from the factory, rather than by a separate sales organization. It is felt the new arrangement for sales and shipping will insure closer control to speed delivery of orders to industrial dealers and users throughout the country.

As in the past, the original, time-tested Cone-Loc Drum Sander, which uses inexpensive strips of coated abrasives for all types of grinding, polishing or de-burring operations, is available in 4", 6", 8", 10" and 12" diameters with standard rubber cushion. Felt cushion sanders are available in 6¼" diameter. Prices remain unchanged except for a small reduction in the rubber recushioning price.

Herman Stone Expands

New equipment and facilities for relapping granite surface plates up to 3' x 4' have been installed at the Herman Stone Co., Dayton, Ohio. These facilities supplement the Herman Stone factory in Mt. Airy, N.C., where all relapping was previously done.

The new facilities are temperature and humidity controlled around the clock to insure accurate measuring standards. Special optical measuring instruments for checking the surface plates have also been installed. The equipment is reportedly accurate to such a degree that it will detect an error from a straight line or true plane of less than one millionth of an inch.



MANHATTAN DIAMOND WHEELS

Faster Cutting . . . Longer Life

Diamond wheels must be specially *bonded* to permit faster precision grinding . . . and assure longer wheel life. Manhattan Diamond Wheels give you faster, cooler cutting action *plus* higher wheel efficiency and longer life on even the toughest jobs. They will not load or glaze, and require no dressing for wet or dry grinding. Resinoid bonded for tungsten carbide grinding, they cut cool and free with only light pressure, thus eliminating the danger of damage to heat-sensitive carbide. Special metal bonds assure the end result you require for glass, quartz and ceramics.

Manhattan Diamond Wheels are made in a variety of surface-contact shapes . . . the *exact* size and shape for your specific grinding conditions. Diamond concentration and grit size are also determined by your job requirements. You get a higher degree of efficiency for all cutter, surface, cylindrical or internal grinding . . . "More Use per Dollar" . . . when you use Manhattan Diamond Wheels. Try them . . .

RM 847

WRITE TO DIAMOND WHEEL DEPARTMENT

MANHATTAN RUBBER DIVISION — PASSAIC, NEW JERSEY

RAYBESTOS-MANHATTAN, INC.

Belts • Hose • Roll Coverings • Tank Linings • Industrial Rubber Specialties • Abrasive and Diamond Wheels • Brake Blocks and Linings • Clutch Facings • Asbestos Textiles • Mechanical Packings • Engineered Plastics • Sintered Metal Products • Industrial Adhesives • Laundry Pads and Covers • Bowling Balls

Keystone Plating Serves Metal Finishers in Michigan

A new company, Keystone Plating Supply Inc., has been formed to serve the metal finishing industry in Michigan. The location is at 21039 Dequindre, Hazel Park, Mich. Jack E. Keyes and Henry V. Pfeuffer, founders and co-owners, are former sales executives of Wagner Brothers Inc., Detroit.

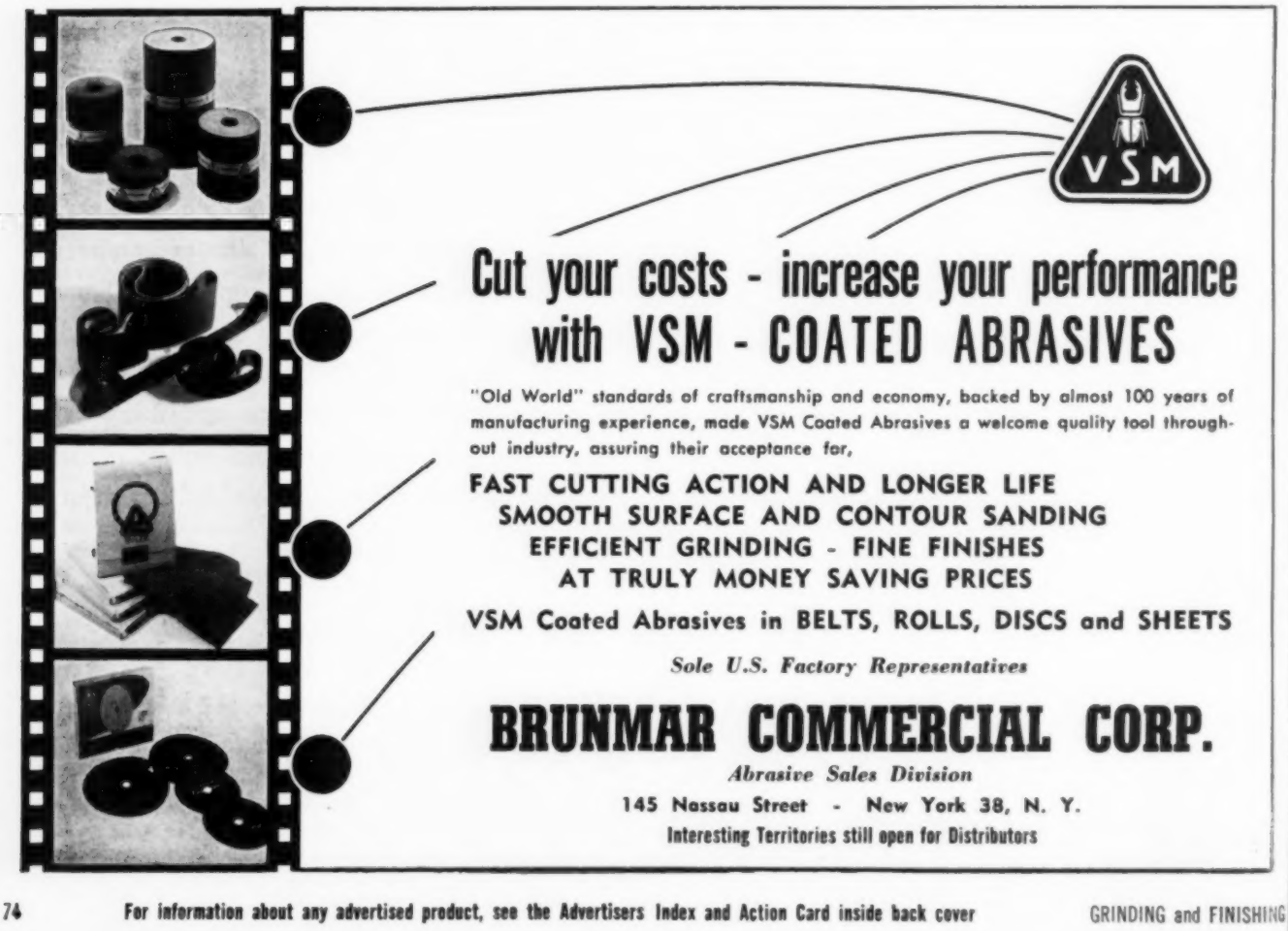
Among the products offered by the company are Churchill buffs; Promat zinc and cadmium addition agents and conversion coatings; Grav-I-Flo tumbling materials; anodes and other finishing supplies.

Miniature Precision Bearings Builds $300,000 Addition

The 25,000 sq. ft. $300,000 addition has been completed at the Miniature Precision Bearings, Inc. plant at Keene, N.H. President Horace D. Gilbert reported that the "added production area now makes it possible for MPB to offer thirty-day delivery lead time on bearing orders."

The company produces more than 500 types and sizes of miniature ball bearings for aviation instruments, guided missile components, medical and dental instruments, and electronic components.

WEST COAST'S FIRST ULTRA-PRECISION GRINDER arrives at Los Angeles by American Airlines "Airfreighter" from Rhode Island, on its way to Parker Aircraft Co.'s Southern California plant. There it will produce fluid handling component parts accurate to 10 millionths of an inch. On hand to receive the Brown & Sharpe Ceda/Size plain grinder are (left to right): Parker Hydraulic Division Manager, Thomas Fitzgibbon; Vice-President A. V. Zukas; and Hydraulic Division Superintendent, Chet Dotter. Representing Brown & Sharpe are Tom Hindson, grinding engineer who supervised shipment of the precision machine, and John Rinek, District Sales Manager.


VSM
Cut your costs - increase your performance
with VSM - COATED ABRASIVES
"Old World" standards of craftsmanship and economy, backed by almost 100 years of manufacturing experience, made VSM Coated Abrasives a welcome quality tool throughout industry, assuring their acceptance for,
FAST CUTTING ACTION AND LONGER LIFE
SMOOTH SURFACE AND CONTOUR SANDING
EFFICIENT GRINDING - FINE FINISHES
AT TRULY MONEY SAVING PRICES
VSM Coated Abrasives in BELTS, ROLLS, DISCS and SHEETS
Sole U.S. Factory Representatives
BRUNMAR COMMERCIAL CORP.
Abrasive Sales Division
145 Nassau Street - New York 38, N. Y.
Interesting Territories still open for Distributors

DoAll's Beat-The-Recession Progress

"Positive Proof—The Way Out of A Recession" is the title of bulletin from R. J. Wilkie, President, The DoAll Co. Des Plaines, Ill. It is a bulletin to the sales force on the firm's anti-recession measures.

"There is no question that the boom-or-bust nature of the machine tool industry makes it particularly vulnerable to business recessions. There is also no question that this industry is one of the most pivotal; and that it has the latent propensity for improving the situation. Improved production means are among the very few prerogatives open to management for product and profit improvement without price increases.

Proof—not words, is the object of this band machining demonstration. New model DoAll machines are mounted on trailers so that they can be taken into customer's plants and demonstrated under shop conditions, using actual jobs.

"We know, for instance, that DoAll machines today are capable of production undreamed of ten years ago, averaging 650% greater. We know, too, that replacing the ten-year-old band machines with new heavy production models will be a positive step in helping our customers end the recession for themselves—and will certainly end it for us.

"The results of our hard-sell program show that the positive approach does get results. We can only conjecture whether or not there would have been a recession if we had all been using traditional Yankee salesmanship all along," Wilkie said.

American Buff Passes the Buck

Monday, September 15, was the 23rd anniversary for American Buff Co. of Chicago, at which time Leonard B. Sax, President, passed the buck to all of the employees—23 silver bucks, that is.

Each year every employee "gets the sack" containing the amount of silver dollars corresponding to the number of years the company has been in business.

Nat'l Conference on Standards To Be Held November 18-20

"Standardization—What's In It For Me?" will be the theme of the Ninth National Conference on Standards to be held at the Hotel Roosevelt in New York, November 18 through 20.

Among the industries that will discuss the benefits to be derived from standards will include those concerned with forgings and castings, nonferrous metals, plastics, containers for hazardous substances, electrical machinery, and machine tools. Also on the program are sessions of interest to the purchasing agent and the military engineer.

The conference will open 10:00 a.m., Tuesday, November 18, with a welcome by the President of the American Standards Association, H. Thomas Hallowell, Jr., President of Standard Pressed Steel Co., Jenkintown, Pa.

Safety Program Pays Off

Du Pont employees are three times less likely to get hurt away from work and four times less likely to be killed in auto accidents than the average person in the United States, according to the company's statisticians. This came as a result of their poring over their accident records for the first six months of this year. Du Pont's 90,000 employees are so safety-conscious on the job that a lot of it sticks with them when they go home.

After observing that employees were about 15 times safer at work than away, the company inaugurated an off-the-job safety program in 1953. Now it is paying off—the rate of injuries away from work has declined over 25%. Results have showed up particularly in the form of fewer auto accidents and falls at home.

Occupational Skin Diseases Can Be Prevented

Inflammation of the skin, the most common industrial disease, is largely preventable, according to the American Medical Association's committee on occupational dermatoses. Lack of personal cleanliness is the most important factor in the development of occupational skin disease, the committee said in a report in a recent A.M.A. Journal.

The committee recommended several things that can be done in the working environment to limit the development of dermatitis.

Hot tip?

Listen Charlie...This is straight from the horse's mouth! The hot tips I've seen in my day could stretch clear to Santa Anita!...But what we should be wise to is Cutting Tool Tips!

Why the way slow-speed, dry machining burnt up tools and profits at my shop...I coulda' been touted by a one-eyed spinster who'd stuck a crooked hat pin through her program!

Well, my tool supplier comes in and he says to me, "Herman," he says, "I got the answer to your prayers!"

I am suspicious. "So what race is he runnin' in? And what are the odds?"

"It ain't a horse, Herman! This here is Kett Tool's new Mist Coolant Generator! They call it Mystic Lube!"

"So what does it do?"

"Well, mostly it saves you money"—he says. "The mist cools where it counts, right at the cutting surface. You take deeper cuts at faster speeds ...and still get longer tool life!"

"That's a pack of promises, friend."

"Do not take my word for it, Herman. Try it yourself...It's a sure thing!"

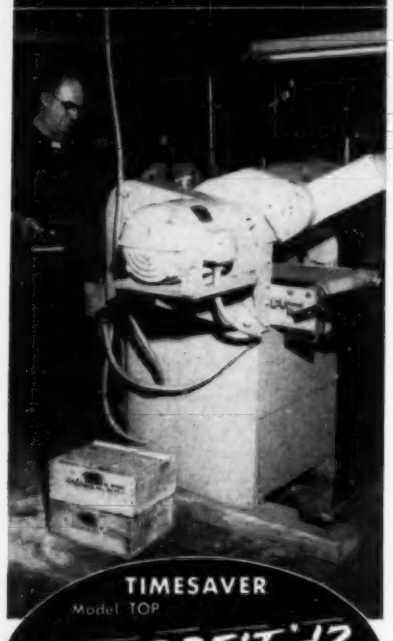
"So I took him up on it...and you know, he was right. What I saved on diamond wheels alone I bought me a couple more Mystic Lubes."

"Yeah, Charlie...Write the Kett Tool Company—they've got 'em!"

"Mystic Lube"
Mist Coolant Generator

KETT
TOOL CO.
5061 Madison Rd., Cincinnati 27, Ohio

"650 metal stampings deburred in 10 minutes"



TIMESAVER
Model TOP
SPEEDBELT '12
ABRASIVE BELT SANDER

V. A. BOKER & SONS, Minneapolis, Minn., manufacturer of precision metal stampings reports:

"We processed 675 metal stampings using a Speedbelt 12 and 2 men in 1 hr. 40 mins. or 3 hrs. 20 mins. of direct labor charged against the job. By old deburring methods this run would have taken in excess of 20 hours. Another run of 650 metal stampings was completed in 10 mins., or 20 mins. direct labor compared to 4 hrs. by former deburring methods. These runs are typical of the savings in production time we have made on this type of work. We also find we are achieving a much better finish as well."

TIMESAVER "SPEEDBELT" SANDERS CAN HELP CUT YOUR PRODUCTION COSTS . . . TOO!

V. A. Boker & Sons' experience is typical of the many installations where versatile, low-cost Timesaver "Speedbelt" Sanders have replaced slow, costly deburring, finishing and polishing methods. Timesaver Sanders are built in 12", 18", 24", 38", 50" and 54" models . . . a size and type to solve most polishing, finishing and deburring operations on solid or perforated aluminum, stainless steel and other metal sheets, bars and blanks.

INVESTIGATE the advantages of these amazing machines and hi-speed abrasive belt operations for your shop. Write for literature today.

TIMESAVER SANDERS
Box 7446, Robbinsdale Station
Minneapolis 22, Minn.

PRATT & WHITNEY DISTRIBUTION WAREHOUSE—A 4,000 sq. ft. building was constructed adjoining the Pratt & Whitney's Sterling Die Division plant at Cleveland, Ohio, to house the new modern stockroom facilities. Herbert Yankee, P & W Vice-President and Manager of Sterling Die, will be in charge of the Cleveland warehouse operation. Cutting tools and gages will now be available to stores and distributors outside of New England, Eastern New York, New Jersey and Pennsylvania. A new combined order-invoice system will help process orders.

A clean and well-ventilated plant is more likely to be free of irritating and sensitizing substances. Conveniently located washing facilities and frequent washing by the workers is needed. Protective clothing should be worn. When this is not practical, protective ointments or barrier creams may aid in skin protection. Medical treatment should be available when a worker develops a dermatitis.

$1½ Million To Be Spent For Double Piercing Project

At a cost of an estimated $1½ the Steel and Tube Division of The Timken Roller Bearing Co., Canton, Ohio will install a new piercing mill at its Gambrinus location.

The new unit will be combined with existing Gambrinus piercing mill operations permitting the company for the first time to "double pierce." The new producing facilities will make it possible to produce hot rolled tubing with thinner wall dimensions in both stainless and alloy grades as well as improved inner surface and center wall quality—of value in the power production, chemical and nuclear fields where high temperature, high pressure tubing is needed.

An addition of 180' will be made to the present tube mill building, and the 72' rotary furnace will be moved into the new extension. Existing machinery and the new piercing mill will be installed in the proper sequence with the rotary furnace as the starting point.

The bulk of the work is expected to be done in July of 1959. The new equipment is part of the $51 million expansion and modernization program taking place during the next five years.

GM Proposed Revisions Of Hydraulic Standards

General Motors proposals for revisions in the Joint Industry Conference Hydraulic Standards for Industrial Equipment are now released for distribution to equipment users and suppliers.

John Q. Holmes, Director of GM Production Engineering Section, said the proposed revisions and additions to the JIC Hydraulic Standards were recommended by GM divisional master mechanics and plant engineers and the GM Plant Engineering Hydraulic and Pneumatic Equipment Committee, and will be submitted to the Joint Industry Conference in the Spring of 1959.

Magazines or journals wishing to publish the proposed revisions may obtain copies by writing Production Engineering Section, General Motors Process Development Staff, General Motors Corp., P.O. Box 128, Detroit 2, Mich.

Ultrasonic Tank Demonstrates Cavitation

Branson Ultrasonic Corp., 40 Brown House Rd., Stamford, Conn., used a

transparent tank to show visitors at the National Metal Exposition & Congress at Cleveland, October 27-31, exactly how ultrasonic energy cleans.

Parts soiled with grease or even insoluble contaminants were immersed in a plastic tank. As power was turned on, soils visibly exploded off plastic and metal pieces without harming

them. Energy for the cleaning action was supplied by a 500-watt Sonogen Model AP-100 ultrasonic generator whose electrical pulses were changed into mechanical vibrations by a transducer mounted in the tank. The vibrations caused cavitation—the formation and collapse of thousands of voids throughout the liquid, each acting as a tiny scrub brush.

Two ultrasonic resonance gages, the Model 14 and Model 21 Vidigage, which measure metal or plastic thickness instantly, were also shown.

Electronics-Instrumentation Added to GM Research Depts.

A new Electronics-Instrumentation Department, as part of General Motors Research Laboratories, was announced recently. The department will service the more than 15,000 instruments used at the Laboratories, assist Research personnel in acquiring basic data for various engineering and scientific projects, and develop advanced instrumentation, particularly in the electronics field.

Albert F. Welch is heading the organization. Except for a brief term with the Cadillac Motor Car Division, his business career has been in the employ of GM.

GE Creates Lamp Metals And Components Department

The General Electric Lamp Division of Cleveland has formed a new Lamp Metals and Components Department. The new department consolidates two GE departments supplying light bulb parts, the Lamp Leads and Bases Department and the Lamp Wire and Phosphors Department. These comprise nine manufacturing facilities and associated functions which will continue their activities under the new department.

Robert F. Johnson has been named General Manager. He joined the GE Lamp Division in 1945, and since that time has held several manufacturing positions.

Taft-Peirce Adds Two New Agencies

The Taft-Peirce Manufacturing Co. of Woonsocket, R.I. has appointed The Tool Crib of Minneapolis to cover the entire state of Minnesota and Douglas County in the state of Wisconsin. They will handle Taft-Peirce fixed gages, production and inspection tools, magnetic chucks, and instrument gages.

The House of Tools of San Carlos, Calif., has been appointed to cover northern California and Nevada. They will also handle the Taft-Peirce line.

● ACTUAL MANUFACTURERS OF RESINOID METAL AND VITRIFIED DIAMOND WHEELS UP TO AND INCLUDING 20" DIAMETERS

Call or write for literature today!

TRADE MARK
THE P.L. KUZMICK CO. VERONA, N.J.

THE PAUL L. KUZMICK COMPANY
271-279 GROVE AVE.
VERONA, N.J.

A good connection for
COATED ABRASIVES

Just because a firm does business all over the map *does* mean something. It means that individual orders and inquiries have been and are getting the proper attention. It also means that the product must be right. Only devotion to quality and service can push business right out to the corners of the world.

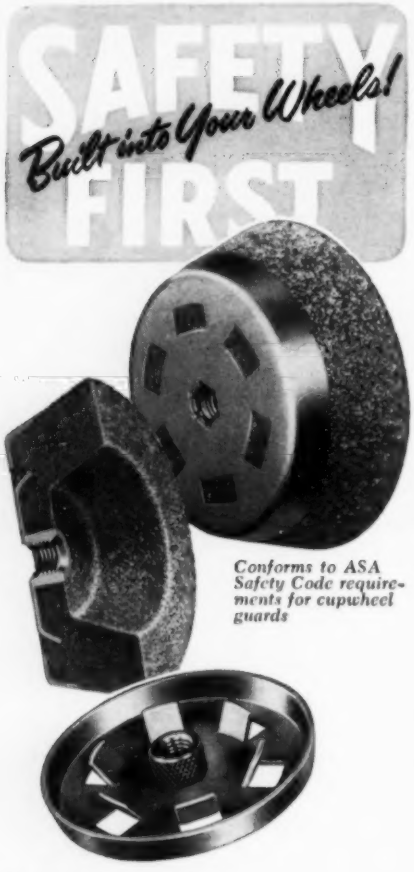
Telephone your Clover Coated Abrasives Distributor for a new Clover Catalog, or write us direct. You owe it to yourself to see what Clover sells to the Nation *and* all over the map.

Clover Manufacturing Company
Norwalk, Connecticut
Victor 7-4515
Since 1903
Makers of the famous
CLOVER Grinding and Lapping **COMPOUNDS**

● MANUFACTURERS OF RESINOID AND RUBBER BONDED WHEELS SERVING THE AIRCRAFT, CUTLERY AND STEEL FABRICATING INDUSTRIES.

Call or write for literature today

PEKAY ABRASIVES, INC.
271 GROVE AVE.
VERONA, N.J.



Conforms to ASA Safety Code requirements for cupwheel guards

CARROLL'S SAFETY-GUARD INSERTS

Give you BUILT-IN Operator Safety and Top Performance.

This radically new Safety Guard Insert with its integrated revolving guard gives you the all-important safety factor with increased wheel strength and efficiency.

Added economies in production are gained from the ready-made molding form provided by the Guard. True dynamic balance, back flatness and concentricity, show consistently close tolerances within .010 T.I.R.

Safe grinding wheels mean increased production — use and specify wheels with the new Carroll Safety Guard.

• A Positive Guard on Every Cup Wheel • Highest Safety Factor • One Piece Assembly • Increased Strength • Light Weight • Fool Proof Mounting • No Adjustment Necessary • True Dynamic Balance

CPM INC. *Write for Information on Carroll's Safety Guard Insert*

CARROLL
PRESSED METAL, INC.
133 DEWEY ST.
WORCESTER 10, MASS.

NEWS OF INDUSTRY *continued*

Headquarters For Bryant Gages & Surface Plates Move to Ohio

Headquarters for the Bryant gages and surface plates has moved from Springfield, Vermont, to the Ex-Cell-O plant in Greenville, Ohio. The Bryant line includes thread and groove gages for production checking, and long-wearing true granite surface plates made to precision standards and stocked in various sizes. Ex-Cell-O acquired the Bryant Chucking Grinder Co. earlier this year through an exchange of stock.

There is no change in the Bryant sales staff or dealer organization for this line of products. Russell Scholl, who remains in charge of sales of this Bryant line, has moved to the Greenville area.

Electric Steel Foundry Co., Portland, Ore., **The Ladish Co.**, Cudahy, Wis., and the **Hi-Vac Metals Division, Symington-Wayne Corporation,** Depew, N.Y., have been appointed distributors of Oregon metallurgical products of titanium, zirconium, and other reactive metals. This provides a nation-wide outlet for the Oremet products.

Oregon Metallurgical Corp. of Albany, Ore., provides a custom consumable electrode melting service for vacuum melted ingots of reactive metals and super alloys, and produces static and centrifugal castings of these metals. An extensive laboratory exercises close quality control over production as well as providing research and development facilities for improvement of melting, casting, and reduction of reactive metals and their alloys.

The **Joseph B. Clough Co.**, 12414 Cedar Rd., Cleveland 6, Ohio, has been appointed manufacturer's representative in Ohio and eastern Indiana for the **Harig Manufacturing Co.** of Chicago. The Clough Co. will handle sales of Harig tool and dies, including carbide and lamination dies, in these territories.

The Casalbi Co., Jackson, Mich., has appointed the **Finishing Equipment and Supply Co.**, 3702 E. Lake St., Minneapolis 6, Minn., as a distributor for that area. They will handle the complete line of Globe barrel finishing equipment and supplies manufactured by Casalbi.

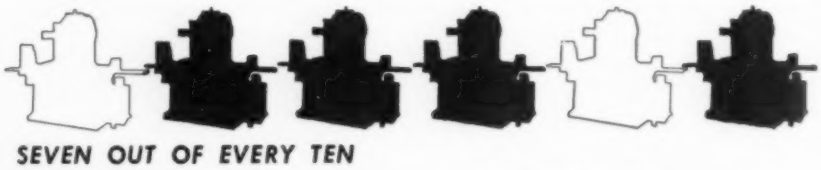
The Finishing Equipment and Supply Co. is a newly formed organization specializing in the finishing field. Win Sabatka and William Bloomquist are the owners.

Arthur Raske, Jr. Appointed Pres. of Nu-Matic Grinders

Arthur Raske, Jr. has been appointed to the position of President of the Nu-Matic Grinders, Inc., 8224 Carnegie Ave., Cleveland 3, Ohio. Raske has served in the capacity of Executive Vice-President for the past six years.

Nu-Matic was formed ten years ago and started in business with a single inflatable finishing wheel. The company now boasts a complete line of finishing wheels, including 48 different types and models. All product development work during the past eight years has been under the direction of Raske, Jr. He has also spearheaded the firm's sales activities.

A little over two years ago, Raske, Jr. organized a subsidiary organization under the name of AMMCO (Abrasive Machine Methods Corporation). This is primarily a sales organization specializing in portable air tools for finishing, drilling, and fastening. AMMCO also handles a line of automatic abrasive finishing machinery.



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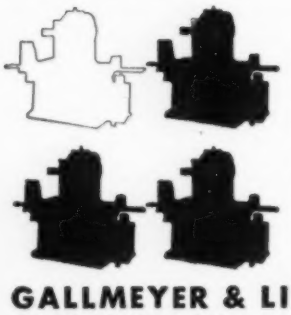

— are purchased by firms already owning one or more of them. Three out of every 10 sold go to new customers. Once you've enjoyed the advantages of a Grand Rapids Grinder in your plant, chances are, like so many present users, you'll surely want more of them.

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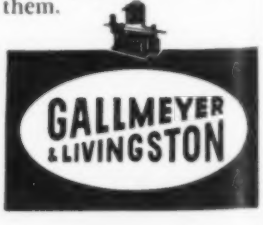

GALLMEYER & LIVINGSTON CO.
416 Straight Ave., S.W. Grand Rapids, Michigan

William A. Simonds, Norton Co. (Worcester, Mass.) Abrasive Engineer in Texas for several years, has been reassigned to the Western Massachusetts area. **Robert C. Divoll,** formerly of the Pittsburgh area, will succeed Simonds in Dallas. **Harold F. Platt,** a recent graduate of the Sales Training Course, has been appointed a field engineer at the Cleveland district office. **John H. Hartleb,** another recent graduate, has been named a field engineer at the Los Angeles district office.

Charles William Thomas, Arcadia, Calif., **Richard Dale Taylor,** Phoenix, N.Y., **Ruel K. Shumway,** St. Louis, Mo., **Donald H. Schultz,** Elm Grove, Wis., and the **Industrial Sales and Engineering Co., Inc.,** Kalamazoo, Mich., have been appointed sales representatives for the Techline Division, Wheelabrator Corp., Vicksburg, Mich.

The **Industrial Sales and Engineering Co., Inc.** will cover the lower peninsula of Michigan. Salesmen who will handle the Techline line throughout Michigan are **Keith L. D. Foster,** Vice-President, and **Floyd M. Bevans, Ronald Warren, Charles N. Albrecht, James Souers,** and **Williams F. Burton.**

John T. Bennett has been named Sales Manager of Gorham Tool Co., Detroit, designers and manufacturers of high speed steel and carbide tipped cutting tools. In his new position, Bennett will direct the sales, engineering and service activities of Gorham field representatives, as well as sales through distributors of the company's line of cutting tools.

J. T. Bennett

W. H. Armstrong

Since joining the firm in 1940, Bennett has served in various capacities, including production, engineering and sales.

William H. Armstrong has been elected to the position of Vice-President and General Manager of Metal Finish, Inc., Newark, N.J. Metal Finish, Inc. is the U.S. sales agent for the recently developed Vibraslide barrel finishing machine. They also manufacture other metal finishing equipment and accessories. Armstrong has been in the barrel finishing field for over 15 years.

The Board of Directors of the Reed Roller Bit Co., Houston, Texas, parent company of Cleco Air Tools, announced the election of a new chairman of the board, a new president, and three new directors.

R. O. Shaffer

Ray O. Shaffer, President of Welex, Inc., Ft. Worth, Texas, was elected a Director of Reed and will serve as Chairman of the Board. **John F. Maher,** former President of Oil Center Tool Co., Houston, was elected a Director and the new President of Reed, replacing **Rex G. Hamacker,** retiring Director and President.

J. Maher

A. H. Rowan, Chairman of the Board of Directors of Rowan Drilling Co., Ft. Worth, Texas, is the other newly elected Director.

Board members remaining on the Board are **John H. Blaffer, S. P. Farish, Claud B. Hamill, J. W. Link, Jr., John Mecom,** and **Wharton Weems.**

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Grinding Outer Surface of Cone Shaped Part

Grinds and Laps in One Operation

Helped Hupp Aviation Solve Visual Finish and Deburring Problems

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by James Price & Joseph Biglin

How Heat Distortion Affects Large Surface Grinders
by John C. Wilson

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by James R. Gilman

The Cleaning of Grinding & Finishing Coolants
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Dress Profiles like these in a few minutes without Templates or Crusher Rolls with the Jeon Automatic Angle Tangent to Radius Dresser. It's fully universal.

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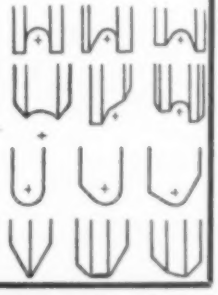

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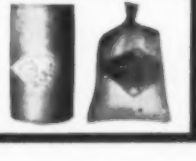

Barrel Finishing Equipment — Abrasive Media & Compounds. Write for Data Sheets and Price List. GF-11.

NEWS OF INDUSTRY - *continued*

K. P. Martin

C. E. Thorup

Kenneth P. Martin has been named as Industrial Sales Manager and **Carl E. Thorup** as Advertising Manager for Sunnen Products Co. of St. Louis. Before coming to Sunnen, Martin was associated with LeMaire Machine Tool Co. and Thorup with Joy Manufacturing Co.

The Abrasives Division of the Elgin National Watch Co. announces the appointment of **Forrester B. Svendsen** as sales engineer. Svendsen will handle sales and engineering in New York State, excluding the metropolitan area, as well as northwestern Pennsylvania.

G. C. Kirker

George C. Kirker has been named Plant Manager of the Montebello Division of Western Design & Mfg. Corp., Santa Barbara and Montebello, Calif.

Western Design, a division of U. S. Industries, Inc., is engaged in design, development, and manufacturing of landing gear, constant speed drives and other hydraulic systems, as ground handling equipment for aircraft and missiles in its Montebello facility.

Prior to his Western Design appointment, Kirker was Chief Engineer at Western Gold and Platinum Corporation.

E. E. Kennie

Edward K. Kennie has become affiliated with the Southworth Machine Co., Portland, Me., as Coordinator of Engineering and Manufacturing for Southworth's Lift Table Division.

Kennie started his career as a machinist's apprentice and came up through the shops, foundries and maintenance departments of several large companies to the office of Superintendent of Production and Coordination at Continental Copper & Steel Industries, Inc., Walsh Holyoke Division, where he was prior to coming to Southworth. Time was taken out along the way for wartime service in the Merchant Marine.

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Our reclaiming department salvages diamond powders from wheels, sludges, hones, saw blades, cotton wastes or any type of diamond bearing material. We will submit quotations on an analysis basis.

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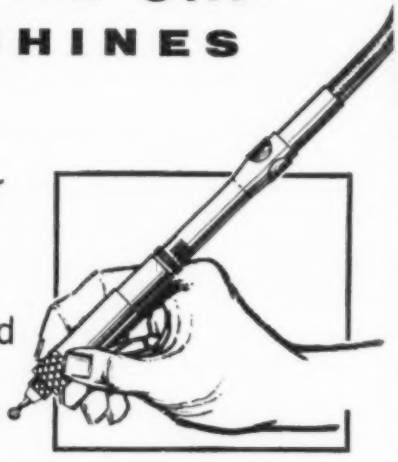

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C. B. Persons

C. Berton Persons has been named representative for the Industrial Division, Metalwash Machinery Corp., Elizabeth, N. J., manufacturers of finishing systems for the metal products manufacturing industry. In his newly created post, Persons will represent the company in the greater Cleveland market area. He has a background of executive sales and engineering experience in the metal products industry.

George M. Seib, formerly Secretary of Oakite Products, Inc., has been appointed Vice-President of the company, which manufactures industrial cleaning and metal treating compounds. **Erwin H. Steif**, who was Seib's assistant, has been promoted to the post of Secretary.

With Oakite since 1922, Seib has been a member of the Board of Directors since 1946, and has served as Secretary since 1953. Steif, a graduate of Yale Law School, joined Oakite in 1948 as legal counsel, and has served on the Board of Directors since 1953.

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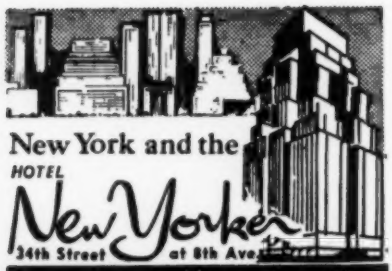

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G. T. Grimstad

B. C. Hammer is the new Plant Superintendent of Elizabeth Carbide Die Co., Inc., of McKeesport, Pa. In his new position, he will oversee the manufacture of both carbide and steel punches and dies for either single punch and rotary type presses used in compacting various materials. Engraving and embossing dies in all shapes and sizes will also be a part of his responsibility.

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Gordon T. Grimstad is the new Sales Manager of Bendix Filter Division, Bendix Aviation Corporation, Madison Heights, Mich. He will direct sales of all Bendix Filter Division products including filters for handling aircraft piston engine, jet engine and missile fuels, filters for hydraulic fluids and lubricating oils, to name a few.

Grimstad has been associated for the past four years with Omark Industries, Portland, Ore., in various capacities.

Obituary

Herbert D. Nelson of the American Abrasive Co., Westfield, Mass., died September 30, according to word from the Grinding Wheel Institute and Abrasive Grain Association of Cleveland.

John Basch of Precision Grinding Wheel Co., Philadelphia, died September 25, according to word from the Grinding Wheel Institute and Abrasive Grain Association of Cleveland.

Harrison Fuller, a Director of the Grinding Wheel Manufacturers Association, died at his home in Hamden, Conn. on September 22. He was 66 years old. Fuller was President and Treasurer of the Fuller Merriam Co. of West Haven, Conn. At the time of his death he was also President of the Manufacturers Association of Conn.

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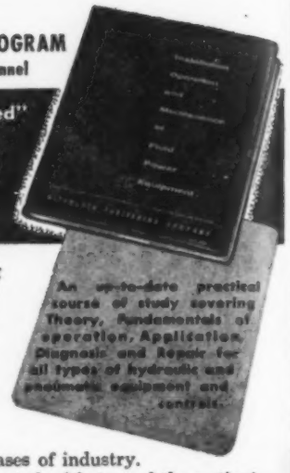
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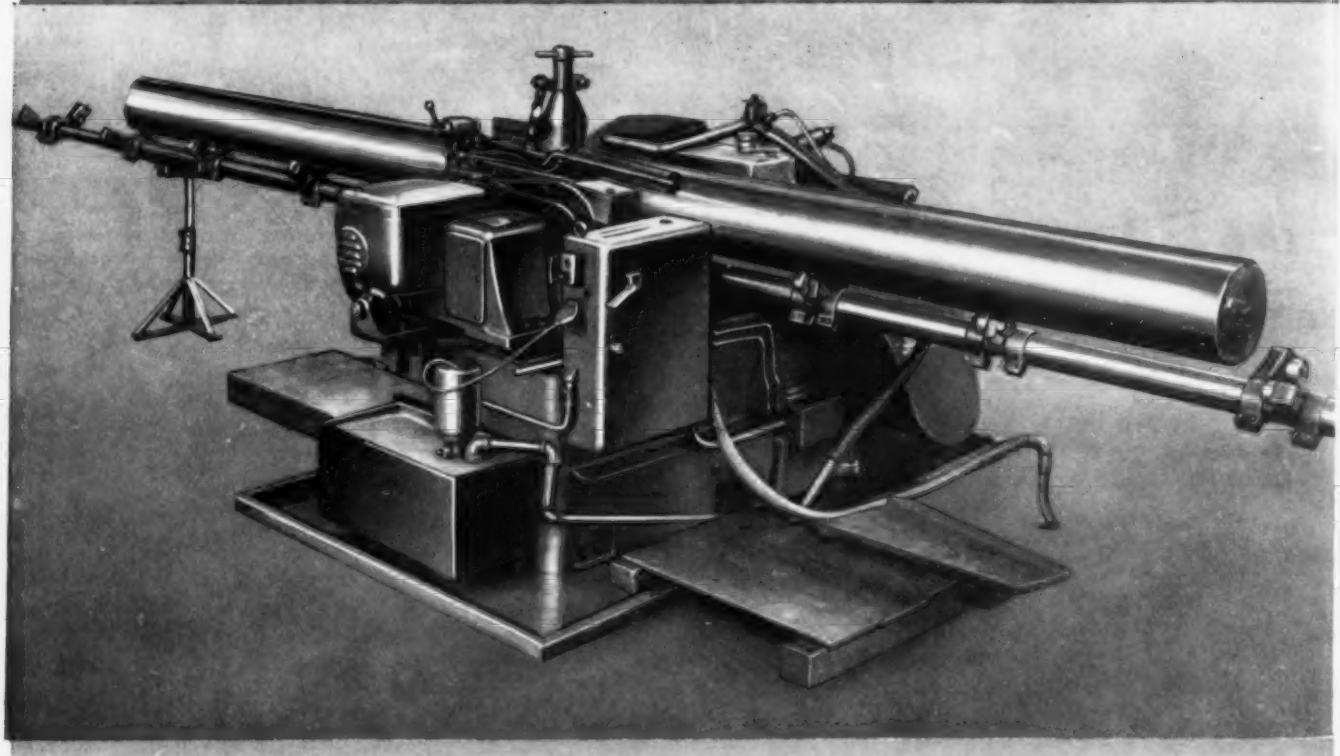

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